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# Narcissistic worldview: How narcissism relates to perceptions of conflict and exploitative behaviour

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**Abstract**

Narcissism is associated with highly competitive and exploitative behaviour. This thesis examines the possibility that these behaviours may be, in part, due to a bias to perceive a high amount of social conflict, thus promoting exploitative behaviour through greed or to avoid being taken advantage of. Two studies tested this possibility through a game format – one a novel anagram task, and the other a Commons Dilemma task. Results across both studies suggest that individuals high in grandiose narcissism perceive a higher amount of conflict than individuals low in grandiose narcissism, regardless of the degree of conflict inherently present. Study 2 additionally found that those high in grandiose narcissism behaved more exploitatively and were motivated by both the desire to maximize their own profits and the belief that others would do the same, although this effect, was primarily driven by antagonism. Results for vulnerable narcissism were more mixed, with a positive relationship to perceptions of conflict when the degree of conflict was ambiguous but no relation to exploitative behaviour in a Commons Dilemma. Combined, these studies provide evidence in support of the hypothesis that individuals high in grandiose narcissism, and particularly antagonism, are biased to perceive higher amounts of social conflict and behave exploitatively.

*Keywords*: narcissism, grandiose, vulnerable, antagonism, acquisitiveness, apprehensiveness, Commons Dilemma, interdependence, conflict

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Most people can conjure up an image of a specific person when they hear the word "narcissism." They may think of someone they know personally in their lives, or a certain world leader. Typically, those immediate conceptualizations of a narcissist are not positive – possibly including being manipulative, rude, self-centred, and so on. But how do individuals who are themselves high in narcissism perceive others, and their intentions in social situations? This paper focuses on the perceptions of those who are high in narcissism, to better understand what processes may contribute to narcissistic behaviour. Do people high in narcissism differ from people low in narcissism in their perceptions of social situations, specifically in the degree of conflict present? And do those differences promote exploitative behaviour?

Narcissism can be broadly characterized as a set of personality characteristics related to an inflated sense of self. Over years of research into narcissism, there have been several different models proposed to distinguish between different presentations of narcissism, or different "types" of narcissism (Zeigler-Hill & Jordan, 2013). This thesis will focus on the distinction between grandiose and vulnerable narcissism, as well as a trifurcated model, with three underlying dimensions, which will be discussed in Study 2.

**Grandiose Narcissism**

Grandiose narcissism is associated with an extraverted type of inflated sense of self. This sense of self is maintained through two sets of psychological processes – self-promotion, which is related to "bright" traits, such as high self-esteem, confidence, and extraversion; and self-protection, which is related to "dark" traits, such as exploitativeness, competitiveness, and manipulativeness (Back, et al., 2013). These two pathways can both be used to maintain an inflated sense of self. This newer understanding of narcissism is consistent with previous findings that people high in narcissism tend to be highly competitive (Luchner, et al., 2011),

extraverted (Lee & Ashton, 2005), exploitative (Miller & Campbell, 2010), and more likely to engage in marital infidelity (McNulty & Widman, 2014).

These dual pathways for maintaining grandiose self-views are explicitly modeled within the narcissistic admiration and rivalry concept (NARC) model of grandiose narcissism (Back, et al., 2013). Within the NARC model, those high in grandiose narcissism use a self-promotion pathway—known as *narcissistic admiration*—to maintain grandiose self-views; however, they also use a self-protection pathway—known as *narcissistic rivalry*—engaging in exploitative and manipulative behaviour, in part to position themselves as superior to others. Narcissistic admiration, the self-promotion pathway allows the person to self-enhance and increase admiration of themselves, whereas narcissistic rivalry, the self-protection pathway, allows the person to defend against threats of social failure. Both strategies serve the goal of maintaining a grandiose sense of self. For example, a person high in narcissism may be inclined to boast about their talents and status (admiration), and in the face of potential failure, to devalue others (rivalry). These strategies are effective for creating a positive first impression but become less effective once others get to know someone high in narcissism more deeply (Back, et al., 2010; Giacomin & Jordan, 2019).

**Distinguishing Grandiose and Vulnerable Narcissism**

In addition to the admiration-rivalry distinctions of narcissism[1], it is also possible to distinguish narcissism in terms of *grandiose* versus *vulnerable* expressions. The distinction between grandiose and vulnerable narcissism has a longstanding history in narcissism

[1] Throughout this paper, I discuss narcissism as a trait that remains stable over time, but there is also a possibility to study it as a state that fluctuates within-persons. Some hypotheses from Study 1, not described in this thesis, focused on effects of conflict on state narcissism. I have included a section about state narcissism, these hypotheses and (non-significant) results related to them in Appendix A.

scholarship (e.g., Pincus & Lukowitsky, 2010). Grandiose narcissism is arrogant, extraverted, and exploitative, whereas vulnerable narcissism is withdrawn, fragile, and neurotic. Admiration and rivalry processes were, in fact, first developed to account for different ways of maintaining grandiose self-views within grandiose narcissism specifically, not vulnerable narcissism (Back, et al., 2011); however recent research suggests that rivalry may be related to the concept of vulnerable narcissism, too. For example, the rivalry aspect of the NARC (and not the admiration aspect) is associated with emotional dysregulation – difficulties with understanding and modifying emotional states – in a similar way to how vulnerable narcissism is associated with emotional dysregulation (Cheshure, et al., 2020). Furthermore, there is some evidence that the rivalry subscale of the NARQ more closely correlates with measures of vulnerable narcissism than measures of grandiose narcissism (Miller, et al., 2014). Figure 1 displays a visual representation of this model of narcissism (all figures are presented in the Figures section).

Both grandiose and vulnerable narcissists are low in agreeableness (which corresponds with rivalry), but grandiose narcissists are high in agentic extraversion (which corresponds with admiration), whereas vulnerable narcissists are high in neuroticism (Hyatt, et al., 2018; Sherman, et al., 2015). This distinction is important because it could influence motivations. Vulnerable narcissism, for example, is related to worry, whereas grandiose narcissism is not. Worry is therefore more likely to be a driving factor in the behaviour of individuals high in vulnerable narcissism than it is for those high in grandiose narcissism. Overall, individuals high in either grandiose or vulnerable narcissism do tend to be low in agreeableness, displaying high levels of competitiveness and exploitativeness (Hyatt, et al., 2018; Sherman, et al., 2015).

**The Role of Interdependence Theory**

It may be especially important to study narcissism in the context of social interaction, as many of the characteristics of narcissism (such as extraversion, competitiveness, etc.) can be best seen when viewing those high in narcissism in their interactions with others. To better understand how individuals high in narcissism behave in social situations, it may be useful to consider interdependence theory (Johnson & Johnson, 2005; Rusbult, et al., 2008; Holmes, 2002). Interdependence theory outlines how different aspects of the interdependence in a social situation (such as conflict) may impact how a person responds to others, and how their responses to others may impact how others respond to them. An early model of interdependence suggested that an interaction between two people can vary as a function of both people's needs, thoughts, and motives, and the specific situation that the interaction occurs in. The *situation* can vary in many ways, such as who has more power – e.g., if the interaction is between two coworkers or between one employee and one boss (Rusbult, et al., 2008).

There are two important aspects that can determine each person's responses to the social situation: the first is the objective nature of the interaction, such as if the interaction is between two coworkers or between one boss and one employee, where real differences in power exist; the second is each person's perceptions of the situation and the other's intentions. For example, earlier work has looked at the importance of attachment styles within an interdependence framework. A person with an avoidant attachment style may distrust others and thus act to minimize their perception of interdependence in their relationship due to a feeling that "social relations are not rewarding due to a lack of goodwill in others" (Holmes, 2002, p. 14). This suggests that people with different dispositions can differ in their perceptions of others' intentions, which affects how they interact with others, which can in turn affect how others interact with them.

It is possible, therefore, that individuals can differ in their perceptions of the dimensions of interdependence inherent to a situation. Recent research recognizes that people make judgements about the interdependence they experience in social interactions, and these perceptions affect how they act and respond (Gerpott, et al., 2018). Such subjective interpretations of interdependence could have important implications for cooperative behaviour. If a person believes that other people are going to behave in a cooperative way, they may be more inclined to also behave in a cooperative way; whereas if they believe other people are going to behave in an antagonistic way, they may be less likely to behave in a cooperative way. Their choice of how to behave will in turn affect how the other person responds to them. To the extent that there is an objective level of each of the interdependence dimensions in any given social interaction, it will affect how people respond in the situation, but two people can be in the very same situation and yet perceive the degree of interdependence differently.

Within interdependence theory, there are six dimensions of interdependence by which a social situation can vary. These dimensions are mutual dependence, power, coordination, future interdependence, information uncertainty, and conflict. Conflict will be the focus of this thesis. *Conflict* refers to the degree with which one person's ideal outcome is incompatible with the other person's ideal outcome. This dimension may be particularly important to study in the context of narcissism because of the characteristics associated with narcissism, such as a high level of competitiveness and exploitativeness. It is possible that individuals high in narcissism differ from individuals low in narcissism in their perceptions of conflict in social situations.

These narcissistic tendencies of extreme competitiveness and exploitativeness raise a question about how individuals high in narcissism perceive the intentions of others. It could be that those high in narcissism behave more exploitatively because they expect that others will do

the same. People tend to project their own personality traits onto others (Manchusky, et al., 2014; Hewstone, et al., 2011; Wood, et al., 2010). For example, participants' ratings of their own positive-valence traits, such as being funny and patient, predicted their ratings of targets' levels of the same traits (Manchusky, et al., 2014). Social projection may serve to help people form impressions of others with minimal information, which can be important for deciding how to respond to someone at a zero-acquaintance level. Upon encountering a new person at a party, one has to decide some things about this person in order to know how best to address them, such as whether they are friendly or not. Social projection is a process that can help one to make that sort of judgement. If people high in narcissism project their own worldview onto those around them, it could begin to explain why they engage in competitive and exploitative behaviours to a greater extent than people lower in narcissism. If those high in narcissism perceive others to be more competitive and exploitative, they may feel that they have to be competitive and exploitative to get their "fair share" or to avoid being taken advantage of.

In a situation where there is objectively low conflict – i.e., both people can achieve their ideal outcomes simultaneously without hindering the other person at all – there should be no reason for the two people in the situation to behave competitively. It is possible, however, that one or both of the people will perceive the situation to have a greater degree of conflict than is objectively present. For example, in a group-work situation, where two people are in the same group and expected to produce a joint project, there is objectively low conflict. Both group members can achieve a high grade by working together cooperatively. However, this situation could be perceived as being high in conflict, if, for example, person A perceives person B's goal to be to receive a high grade while doing no work, thus exploiting person A's own hard work. In this situation, person A may adopt an exploitative strategy themselves to avoid being taken

advantage of. This behaviour may then influence person B's behaviour in the group project, too. Thus, the perceptions of interdependence present could influence both participants' behaviour in a social situation.

These considerations are relevant to narcissism because if those high in narcissism project their own personality traits, such as high competitiveness and exploitativeness, onto others, they may perceive situations to be higher in conflict than someone lower in narcissism would. To begin to explore this idea, the present research focuses primarily on one dimension of interdependence: conflict. As described earlier, *conflict* is defined as the degree to which one person achieving their ideal outcome in a situation prevents the other person from achieving their ideal outcome. A high amount of conflict, by this definition, would mean it is impossible for both people to get their ideal outcome, whereas a low amount of conflict would mean that both people can achieve their ideal outcomes at the same time.

Previous research has found that people high in narcissism tend to report more interpersonal conflict than do people low in narcissism, although it is not clear if this is because they perceive greater conflict in situations, or actually experience more interpersonal conflict. For example, Moeller and colleagues (2009) found that individuals high in entitlement, a facet of narcissism, reported experiencing greater interpersonal conflict. The conflict examined in this study was overt conflict or disagreement (i.e., "how often did you have conflicts with other people?"), which differs somewhat from the definition of conflict used in this study - the interdependence theory dimension of conflict (i.e., two or more individuals being unable to all achieve their most desired outcomes in a social situation), although there is some overlap. Research into narcissism in romantic relationships also supports the idea that people high in grandiose narcissism may experience greater interpersonal conflict (e.g. Keller, et al., 2014;

Wurst, et al., 2017). Narcissism is also associated with more hostility and a hostile communication style (Lamkin, et al., 2017; Moeller et al., 2009). These findings could reflect differences in perceptions of the interdependence definition of conflict in those high in narcissism as well. For example, in a romantic relationship, disagreements could form based on differing perspectives on the degree of interdependence conflict present. If a person high in narcissism views their ideal outcome as being the highest paid individual in the romantic partnership, it may cause conflict in a colloquial sense (such as arguments and hostility) but it will also result in that person perceiving a high degree of conflict in an interdependence sense, because it is not possible for both people to have the highest income at the same time, and therefore one's ideal outcome is incompatible with the other's.

**Narcissism and Motivations for Exploitative Behaviour**

Up until this point in this paper, the focus has been on perceptions of conflict, but of course, perceptions of conflict might influence behaviour. This is where the distinction between grandiose and vulnerable narcissism may become particularly important. When comparing grandiose and vulnerable narcissism, it could be that those high in vulnerable narcissism (who are more prone to worry) may differ in their motivations for exploitative (less cooperative) behaviour. Consistent with this idea, Campbell and colleagues (2005) found that those high in grandiose narcissism displayed greater *acquisitiveness* (i.e., desire to maximize their own profits) than they did *apprehensiveness* (i.e., fear that others would exploit them) in a social dilemma task. This pattern of results suggests that the high degree of exploitativeness that those high in grandiose narcissism displayed during this study was not motivated by worry but by greed. This makes sense because worry is not characteristic of grandiose narcissism.

Worry is, however, characteristic of vulnerable narcissism. Someone high in vulnerable narcissism might, therefore, be more exploitative in a social situation because of apprehensiveness about being exploited by others due to a tendency toward neuroticism. Distrust of others is primarily associated with vulnerable narcissism (Sherman, et al., 2015; Crowe, et al., 2019). Distrust of others could lead to apprehensiveness – fear that others would exploit them.

A more recent study (than Campbell et al., 2005) tested differences between motivations and behaviour of those high in grandiose and vulnerable narcissism in a particular social dilemma, the Commons Dilemma (Miller, et al., 2011). Similar to Campbell, et al. (2005; who also examined the Commons Dilemma), they found that grandiose narcissism was associated with more exploitative resource-acquiring behaviour. They expanded upon these results by also examining behaviour in the Commons Dilemma in relation to vulnerable narcissism but found that vulnerable narcissism was not associated with exploitative behaviour in the Commons Dilemma task. They also found that grandiose narcissism was associated with acquisitiveness but not apprehensiveness, as well as with behaving more exploitatively, whereas vulnerable narcissism was associated with none of these. Aspects of the Commons Dilemma may limit the degree of exploitativeness displayed by individuals high in vulnerable narcissism (but not grandiose narcissism), a possibility I describe in more detail in the next section. Notably, Miller et al. did not examine how vulnerable narcissism relates to perceptions of conflict.

**Current Studies**

In this thesis, I will present two studies that broadly aim to address the relationship between narcissism and perceptions of conflict. In Study 1, the focus was on perceptions of conflict in a game setting, whereas in Study 2, the focus was expanded to also include behavioural measures, to test if perceptions of conflict influence behaviour as well. There were

two hypotheses for Study 1 which were also tested in Study 2: (1) Individuals higher in narcissism, compared to individuals lower in narcissism, will perceive a greater amount of conflict; and (2), this effect will be greater for contexts where the degree of conflict present is ambiguous, compared to where it is clearly competitive or cooperative. Study 2 has two additional hypotheses: (3) Individuals higher in narcissism will behave more exploitatively than individuals lower in narcissism. Finally, (4), motivations behind the choice to be exploitative will differ between individuals high in grandiose narcissism and individuals high in vulnerable narcissism, such that those high in grandiose narcissism will be more motivated by the desire to increase their own gains (acquisitiveness), and those high in vulnerable narcissism will be more motivated by the fear that others will behave exploitatively (apprehensiveness).

There is also an alternative possibility for Study 2 that is more consistent with the findings of Miller and colleagues (2011): that grandiose narcissism will be associated with acquisitiveness and exploitative behaviour but not apprehensiveness, whereas vulnerable narcissism will not be associated with any of these in the Commons Dilemma. Although this is what that previous study found, one facet of vulnerable narcissism is low agreeableness (Sherman, et al., 2015) so it is plausible that it should be associated with exploitative behaviour as well. However, the Commons Dilemma is about taking resources rather than contributing resources, and evidence suggests that it promotes greed more than fear (Parks & Hulbert, 1995; Yamagishi & Sato, 1986). If the mechanism behind vulnerably narcissistic individuals' exploitative behaviour is apprehensiveness, motivated by fear, then the Commons Dilemma may not motivate their exploitative tendencies as much as it does for individuals high in grandiose narcissism.

To study whether individuals high in narcissism perceive greater conflict in social situations, it could be useful to use a multi-player game format because this can allow for conflict, within the interdependence theory definition, to be manipulated in a controlled manner within the social situation in which the interaction takes place (Holmes, 2002). In Study 1, I used a joint anagram task, where participants took turns unscrambling a word. This task, which is described in detail later, was designed to be a nondescript interaction so that the conflict manipulations would be the only overt cues of the level of conflict within the game. Specifically, participants did not see their partner or receive any comments from their partner that might influence how they felt about the interaction.

In Study 2, I used a Commons Dilemma task, where participants completed a simulation of a fishing industry in which they extracted fish from a common pool across a series of fishing seasons. This task is also described in detail later. This again served as a nondescript interaction where participants did not receive any overt cues about the level of conflict besides the conflict manipulations provided. Unlike the anagram task, however, this one allows for participants' cooperative (or exploitative) behaviour to be measured as well as their self-reported perceptions of conflict during the task. In both studies, participants were incentivized with a reward[2] purportedly tied to their performance (at the end, everyone received the same reward regardless of performance). This was done to encourage participants to be motivated to care about their performance on a task which might otherwise be meaningless to them. However, it is important to note that hypothetical points alone may be enough to motivate participants in social dilemmas, without any additional reward (Ben-Ner & Levy, 2008; Locey, et al., 2011).

[2] In Study 1, the reward was three pieces of "fun size" candy; in Study 2, the reward was raffle tickets for a $50 gift card.

For Study 1, I predicted that participants higher in narcissism would perceive greater conflict in the anagram task overall, and that this effect would be stronger when the degree of conflict in the game was ambiguous compared to when it was explicitly cooperative or competitive. Study 1 only measured grandiose narcissism; however, the prediction was the same for both vulnerable and grandiose narcissism in Study 2. Study 2 had additional hypotheses regarding behaviour. Specifically, I predicted that individuals who were high in either grandiose or vulnerable narcissism would also behave more exploitatively in the Commons Dilemma task than individuals who were lower in narcissism. Although the predictions for behaviour for grandiose and vulnerable narcissism were the same, the motivations behind this exploitative behaviour were predicted to differ between the two. I predicted that the exploitative behaviour of those high in grandiose narcissism would be motivated by the desire to maximize their own profits (acquisitiveness) more than the fear that others would deplete the resource by behaving exploitatively (apprehensiveness), but the exploitative behaviour of those high in vulnerable narcissism would be motivated by the fear that others would deplete the resources, leaving them with few, more than by the desire to maximize their own profits. There is, however, an alternative possibility that due to the nature of the Commons Dilemma highlighting greed instead of fear, that those high in vulnerable narcissism may not be more apprehensive or behave more exploitatively in this task. This possibility would be consistent with the findings of Miller, et al. (2011).

## Study 1

Study 1 aims to address two hypotheses about the relationship between conflict and narcissism using a partner word unscrambling game. The instructions for the game indicate that participants are playing this game for points to exchange for candy, and that points are assigned

based on the quality of the choices that they make. Participants were randomly assigned to one of three conditions, which had instructions intended to manipulate the degree of conflict present in the game. In the *competitive condition*, participants were told that whoever made the better selection in the game would get to keep their points and the other player would lose their points. This is intended to be a high-conflict scenario because it is impossible for both people to obtain their ideal outcome (gaining points) at the same time. In the *cooperative condition*, participants were told that their points would be combined with their partner's points, for joint points that both partners receive. This is intended to be a low-conflict scenario because both people achieve their ideal outcome together. Finally, in the *ambiguous condition*, participants were told that they are playing a game for points with another person, but it was not specified how points are allotted. This condition is intended to have an ambiguous amount of conflict because it is unclear how the other person's point-accumulation in the game will affect the participant's points (and vice versa).

I have two hypotheses for this study: (1) I predict that participants who are high in narcissism will perceive greater amounts of conflict than participants who are low in narcissism; (2) I predict that this association will be more pronounced in the ambiguous condition, where the allocation of points and thus degree of conflict is left ambiguous. This will be reflected in a significant interaction between condition and narcissism for predicting perceptions of conflict, where the relation is stronger in the ambiguous condition than the competitive and cooperative conditions.

## Method

### *Participants*

Three hundred and seventy-eight students ($M_{age}$ = 19.52 years old, $SD_{age}$ = 3.20) at Wilfrid Laurier University participated in the study for partial course credit. 77.51% of participants identified as female ($N_{female}$ = 293), 22.22% identified as male ($N_{male}$ = 84), and 0.26% identified as other ($N_{other}$ = 1). 54.50% of participants identified their ethnicity as White (N = 206), with Southeast Asian (14.29%) and South Asian (11.11%) as the second and third most often reported, respectively (N = 54; N = 42). Five percent or fewer of the participants reported their ethnicity as each of the other options.

Participants were recruited through the university's research participation program, PREP. All participants received three pieces of candy upon completion of the study as a supposed reward for their performance on the game.

Twelve participants' data were removed from the final dataset. One of these was removed due to leaving the study after only completing the first set of surveys. The other eleven participants were removed due to self-reporting that they either did not answer honestly, or they did not pay attention to the study.

***Procedure***

This study was completed in-lab at Wilfrid Laurier University. Participants came into the lab in groups of four to six at a time and were assigned to individual cubicles where they completed the surveys on a computer. First, they completed the demographics questionnaire, Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back, et al., 2013), Ten-Item Personality Inventory (TIPI; Gosling & Swann, 2003), and the Preference for Consistency Scale (PFC; Cialdini, et al., 1995). Then, they completed the conflict manipulation in the form of a word-unscrambling game.

*Conflict manipulation*. The conflict manipulation was delivered through a word-unscrambling game, a computer game that was made for this study using Qualtrics. Ten words intended to have a neutral connotation were selected (see Appendix A). Participants ostensibly played with another participant, although they actually completed the game with a pre-programmed partner. On each round, participants began with a scrambled word and took turns with their partner, choosing which option, from a set of options that change the position of one letter, was best to move them toward unscrambling the word successfully. For example, participants would see the letters "NHMTO" with the options "NHTMO", "ONHMT", and "HNMTO" in the first stage. Close to solving the word, they would see "MONHT" with the options "TMONH", "MONTH", and "ONHTM", where the middle option would result in them solving this word. For each word, the computer's responses were programmed for each possible answer that the participant could give each round. In all conditions, participants were told that both they and the other person (either a "partner" or "the other study participant," depending on condition) would take turns choosing answers to move them closer to unscrambling the words, and that points would be assigned based on the quality of the choices they made. In reality, participants selected one of three possible options that they felt was the best option for taking them closer to unscrambling the word; then the program displayed what the "other person" chose as the best option to continue unscrambling the word to the participant. The responses from the computer were predetermined. The words were all designed to be solved by five attempts, to minimize frustration from participants and speed up game play.

Conflict was manipulated through the instructions and wording within the game. In the competitive condition, the instructions said that points would be given to the person (out of the pair playing together) who made the best choices for each word (see Appendix A for complete

instructions). This means that when participants earned points, their partner failed to earn points. In terms of interdependence theory, it was impossible for participants to achieve their preferred outcome of gaining points if the other person achieved their preferred outcome of gaining points, which made it a high conflict situation. In the cooperative condition, the instructions said that each person's total points would be the combination of their own points and the other person's points for each word. This means that it was best for both people if they both did well in the game because both of their total points would be higher this way compared to if one of them did poorly, which made it a low conflict situation within the interdependence framework. Finally, in the ambiguous condition, the instructions simply said that this was a turn-taking game and that points were assigned based on the quality of the choices. These instructions did not explain how the other person's performance in the game would affect participants' preferred outcome of earning points. The wording throughout the game was also slightly different to enforce the different conditions. Table 1 shows the specific differences (see the Table section for all tables). These differences were meant to enforce the idea throughout the game that the participant was either playing with (cooperative) or against (competitive) the other person, or that the relationship was unclear (ambiguous).

Everyone was informed that their points could be exchanged for candy at the end of the session, with more points meaning they could have more candy. This was intended to give participants an incentive to gain points, in order to hopefully make the conflict manipulation more salient. At the end of the session, all participants were given the same amount of candy regardless of performance.

Participants were randomly assigned to one of the three conditions. Following the game, participants were asked to complete the 16-item Narcissistic Personality Inventory (NPI; Ames,

et al., 2006), then the Situational Interdependence Scale (SIS; Gerpott, et al., 2018), and then the Single Item Narcissism Scale (SINS; Konrath, et al., 2014). These narcissism measures were included to test hypotheses about the effects of conflict on state narcissism, which are described in Appendix B, but are not otherwise discussed further. Finally, participants completed a suspicion-check questionnaire and an attention check question. At the end of the study, they were debriefed and given three pieces of candy for their participation.

***Measures***

All of the full measures that were used are in Appendix C. Some of the measures described were assessed during the study but not analyzed for this thesis.

**Demographics Questionnaire.** A 3-item questionnaire asked about participants' age, gender, and ethnicity. Participants then completed additional measures in the following order.

**Rosenberg Self-Esteem Scale.** Participant self-esteem was assessed using the 10-item Rosenberg Self Esteem Scale (RSES; $\alpha = .78$). Respondents indicate how strongly they agree or disagree with statements such as, "On the whole, I am satisfied with myself", on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Half of the items are reversed. The RSES has been found to have strong reliability and validity (e.g. Rosenberg, 1965; Tinakon & Nahathai, 2012). It is important to measure participant self-esteem because grandiose narcissism is correlated with self-esteem (e.g. Locke, 2009). This allows us to try to determine the contribution of self-esteem to any associations between narcissism and perceptions of conflict.

**Narcissistic Admiration and Rivalry Questionnaire.** To assess trait grandiose narcissism, participants completed the 18-item Narcissistic Admiration and Rivalry Questionnaire (NARQ). This questionnaire includes two subscales – one that assesses narcissistic admiration ($\alpha = .80$), with items such as "I am great", and one that assesses

narcissistic rivalry (α = .78), with items such as "Other people are worth nothing" – which are rated on a 7-point scale from 1 (*completely disagree*) to 7 (*completely agree*). There are no reversed items in this questionnaire. The NARQ is a newer measure of narcissism, but demonstrates good reliability and validity (e.g. Back, et al., 2013). Within our sample, the NARQ total score has a Cronbach's alpha of .813. The NARQ-admiration and NARQ-rivalry subscales were significantly correlated, $r = .29$, $p < .001$.

**Ten Item Personality Inventory.** The Ten-Item Personality Inventory (TIPI) was used to assess participant personality on the Big Five traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism. This questionnaire contains two items assessing each of the five traits, and half of the items are reversed. Two of the Big Five personality traits, extraversion and agreeableness, are consistently correlated with grandiose narcissism (Ames, et al., 2006). The TIPI has good reliability and validity (e.g. Gosling & Swann, 2003; Rammstedt & John, 2007). Respondents use a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*), to indicate the extent that they agree with the statement "I see myself as…" with pairs of adjectives targeting one of the Big Five personality traits in each item, such as "extraverted, enthusiastic". This allows us to try to determine the contribution of extraversion and agreeableness to any associations between narcissism and perceptions of conflict.

**Preference for Consistency Scale.** An 18-item Preference for Consistency scale (PFC-18; Cialdini, et al., 1995) was used as a filler questionnaire to mask the focus on narcissism from participants. In this questionnaire, participants respond to items such as "I prefer to be around people whose reactions I can anticipate" on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Situational Interdependence Scale.** Perceptions of conflict were measured with the conflict subscale from the Situational Interdependence Scale (SIS; $\alpha = .79$). Participants also completed the power and mutual dependence subscales for exploratory purposes. Each of the subscales had six items, for a total of 18 items in the version of the SIS that was used in this study. The conflict and mutual dependence subscales are completed on a scale from 1 (*completely disagree*) to 5 (*completely agree*). Example items include "The other prefers different outcomes than I do in this situation" and "What each of us does in this situation affects the other," representing conflict and mutual dependence, respectively. The power subscale is completed on a scale from 1 (*definitely the other*) to 5 (*definitely myself*). An example item is "Who do you feel was most in control of what happens in this situation?"

**Suspicion Probe.** To probe for suspicion and assess how much participants could discern the purpose of the study, participants were asked about any questions they had, if any aspect of the study was not consistent with how it was described to them initially, and finally what they thought the study was about.

## Results

### *Perceptions of Conflict*

To ensure that the condition-specific instructions were effective in manipulating the degree of conflict in the game, a one-way ANOVA was conducted on perceptions of conflict. There was a significant difference between the groups (competitive, cooperative, and ambiguous), $F$ (2, 375) = 6.29, $p$ = .002. Participants did report significantly different perceptions of conflict between ambiguous ($M$ = 4.36) and cooperative ($M$ = 4.20), $t$ (375) = 2.525, $p$ =.002, and competitive ($M$ = 4.41) and cooperative conditions, $t$ (375) = 3.420, $p$ =

.036, although they did not report significantly different perceptions of conflict between the competitive and ambiguous conditions, $t$ (375) = .871, $p$ > .99.

Extending this ANOVA, perceived conflict was also analyzed through linear regression models, where perceptions of conflict (measured through the conflict subscale of the SIS) was the dependent variable, and trait narcissism (measured by the NARQ) and condition (competitive, cooperative, and ambiguous) were the independent variables. The cross-product interaction terms, between narcissism and condition were also included. The NARQ can be split into two different subscales (admiration and rivalry) or kept as the NARQ-total to represent an overall level of grandiose narcissism. Results from all three are presented in this thesis.

Effect coding was used to test the overall effects of narcissism and condition. Results from these analyses are displayed in Table 2 and Figures 2-4. The main effect of narcissism represented the test for hypothesis 1 – that those high in narcissism would perceive greater conflict than those low in narcissism. The interaction between condition and narcissism represented the test for hypothesis 2 – that this effect would be stronger when the degree of conflict was ambiguous compared to when it was clearly competitive or cooperative. Overall, narcissism did predict perceived conflict, with individuals higher in narcissism perceiving more conflict than individuals lower in narcissism, although results based on the NARQ-rivalry subscale only approached significance. Despite the significant main effect of condition, the proportion of variance predicted by the interaction as indexed by the $R^2$-change when adding the two interaction terms was non-significant for all measures, which suggests that there was no interaction of condition and narcissism to predict perceived conflict.

**Discussion**

The results of Study 1 indicate a main effect of narcissism on perceptions of conflict, such that people higher in narcissism perceive greater amounts of conflict regardless of the degree of conflict inherent to the situation. This association is evident for grandiose narcissism overall (NARQ-total scores) but this effect may be primarily due to narcissistic admiration rather than narcissistic rivalry. Since no interaction was found between participants' narcissism and the conflict conditions they were assigned to (competitive, cooperative, or ambiguous) for their perceptions of conflict, we did not find support for our initial hypothesis that it would be the ambiguous condition specifically in which participants higher in narcissism would perceive greater amounts of conflict. Rather, more narcissistic individuals may perceive greater conflict in general, potentially prompting them to behave less cooperatively. This is notable because the study design did effectively manipulate participants' perceptions of conflict, such that those in the competitive and ambiguous conditions perceived greater conflict than those in the cooperative condition. Despite the effects of condition and narcissism on perceptions of conflict, there was no interaction.

Although perceptions of conflict differed according to the conditions which participants were assigned to - those in the cooperative condition perceived less conflict than participants in the competitive condition – there was still room for interpretation of the conflict present. For example, a participant in the cooperative condition where points were combined, may still have felt that they wanted to look better than their partner, regardless of the point allotment. Thus, it was possible for some individuals to perceive a higher degree of conflict even in the cooperative condition. As discussed, participants who were high in narcissism did, in fact, perceive higher levels of conflict across all conditions than participants who were low in narcissism.

It is possible that no interaction was found because the competitive and cooperative conditions still left some ambiguity. It is the case there was no significant difference in perceptions of conflict between the competitive and ambiguous conditions. If the competitive and cooperative conditions had been designed to be more extremely competitive and cooperative, such that there was very little or no degree of ambiguity present at all, then participants regardless of level of narcissism would likely have perceived consistently high or low levels of conflict. That scenario may not be particularly meaningful though, because it is rare that one would encounter a scenario where the degree of conflict had no ambiguity at all. So instead, it could be that the tendency for individuals high in narcissism to perceive greater conflict in general was a more salient effect than the possibility for ambiguity to matter.

One possible limitation to the design was that some of the words that participants unscrambled may have been interpreted differently by participants who were high in narcissism compared to those who were low in narcissism. The words were selected with neutrality in mind, but some, such as the word “empty”, could potentially be perceived as a negative word. Although participants were randomly assigned to condition, it could be that participants high in narcissism were affected differently by the words they were unscrambling than participants low in narcissism, which could potentially account for some of the difference between individuals high and low in narcissism on perceptions of conflict. Perhaps those high in narcissism perceived the word “empty” to be undesirable and it made them feel more competitive. If this did not happen for participants low in narcissism, then it could partially explain why participants high in narcissism perceived greater conflict than did participants low in narcissism. Although this is a possibility, since there were ten words, and participants typically spent about two minutes per word, they likely were not thinking that much about each word.

Nevertheless, in Study 2, I tested whether narcissistic individuals are biased to perceive a greater degree of conflict in a different context. I also extended this finding to test whether greater perceptions of conflict may in turn promote narcissistic behaviour, and further break down which aspects of narcissism may be driving the effects.

## Study 2

Study 2 aims to replicate the finding that more narcissistic individuals perceive greater conflict in social situations than less narcissistic individuals in a different context and examine whether those differences may influence behaviour. To do so, this study utilized a Commons Dilemma task. This is a task where there is a shared resource (such as an ocean of fish) and each player has to choose how to harvest the resource (such as deciding how many fish to extract). After each round, the remaining resources multiply to replenish the resource to some extent. This means that participants have to try to maximize their own profits while also maintaining the common resource. The dilemma that players have is whether to profit more personally and risk depleting the common resources resulting in everyone profiting less, or profit less personally but maintain the common resources. Previous research found that people high in grandiose narcissism tend to behave more competitively and exploitatively in the Commons Dilemma, measured through the number of rounds it takes for the resource to be depleted and the amount of the resource taken in the first round (Campbell, et al., 2005). The Commons Dilemma is an excellent way to understand what motivates cooperative behaviour as there is a competing goal for each individual to behave exploitatively and to cooperate (Pletzer, et al., 2018).

People may decide to fish in an exploitative way based on different motivations. *Acquisitiveness* refers to how much participants want to maximize their own profits (i.e., exploit others for personal gain) whereas *apprehensiveness* refers to how much participants expect that

others want to maximize their own profits (i.e., concern about being exploited by others). Campbell, et al. (2005) found that grandiose narcissism was associated with acquisitiveness but not apprehensiveness. In this study, however, I expect that there may be differences based on the type of narcissism – grandiose or vulnerable.

The differences between grandiose and vulnerable narcissism may result in different motivations for non-cooperative behaviour in the Commons Dilemma. For example, if participants are high in grandiose narcissism, as Campbell, et al. (2005) found, they may show increased acquisitiveness but not apprehensiveness, because they perceive greater amounts of control in the situation and may be willing to exploit others to achieve personal gains. On the contrary, if participants are high in vulnerable narcissism, they may show increased apprehensiveness, but not acquisitiveness, because they perceive themselves as having less control, are higher in neuroticism, and may worry about being exploited by others. They may thus behave exploitatively to avoid being a "sucker."

On the other hand, it is possible that the Commons Dilemma will highlight greed instead of fear as a motivation, so although individuals high in vulnerable narcissism might be motivated by apprehensiveness, this will not translate into exploitative behaviour in this situation (as was found by Miller, et al., 2011). This study differs from the study by Miller and colleagues though due to the conflict manipulation. Their study was more akin to the ambiguous condition of this study since they did not provide instructions to manipulate competitiveness or cooperation. It could be that highlighting conflict through the conflict manipulation, would promote fear for the Commons Dilemma too, even though its traditional nature does not promote fear. Thus, both participants high in grandiose and vulnerable narcissism may display more exploitative fishing behaviour in the Commons Dilemma, but their motivations may differ.

In this study, I use the Five Factor Narcissism Inventory (Sherman et al., 2015) to distinguish between grandiose and vulnerable narcissism. This measure can be scored by dividing its items into two subscales to reflect grandiose and vulnerable narcissism, or it can be scored by dividing its items into three subscales to reflect antagonism, agentic extraversion, and narcissistic neuroticism. These three dimensions reflect the trifurcated model of narcissism, which highlights three distinct dimensions of narcissism (Miller et al., 2017). This model maps onto the distinction between grandiose and vulnerable narcissism in that grandiose narcissism is viewed as consisting of agentic extraversion and some facets of antagonism, whereas vulnerable narcissism consists of narcissistic neuroticism and antagonism. Focusing on the subscales for grandiose and vulnerable narcissism, individuals who score high on items that pertain to reactive anger, shame, need for admiration, and distrust are considered high in vulnerable narcissism, whereas individuals who score high on items that pertain to exhibitionism, grandiose fantasies, indifference, authoritativeness, manipulativeness, exploitativeness, entitlement, arrogance, acclaim seeking and thrill seeking are considered high in grandiose narcissism. Notably, agentic extraversion relates to narcissistic admiration, whereas antagonism relates to narcissistic rivalry. Figure 5 shows how this model relates to the structure of narcissism that was described in the Introduction.

As in Study 1, I predict that (1) those higher in narcissism will perceive greater conflict than those lower in narcissism, and that (2) this may be more pronounced when the degree of conflict is ambiguous than when it is clearly competitive or cooperative. In this study, I additionally predict that (3) people higher in grandiose narcissism, compared to lower in grandiose narcissism, will behave more exploitatively in the Commons Dilemma, replicating the findings of Campbell, et al. (2005). I will also extend this prediction to vulnerable narcissism,

but in a more exploratory way. Miller, et al. (2011) found that vulnerable narcissism was not associated with exploitative behaviour in the Commons Dilemma, however the different conflict manipulation conditions may result in individuals higher in vulnerable narcissism, compared to lower in vulnerable narcissism, also behaving more exploitatively in the dilemma. Finally, I also predict that (4) grandiose narcissism will be associated with greater acquisitiveness (but not apprehensiveness), whereas vulnerable narcissism will be associated with greater apprehensiveness (but not acquisitiveness). This will replicate Campbell, et al. (2005)'s findings for grandiose narcissism and extend the results to vulnerable narcissism as well. An alternative prediction consistent with Miller, et al. (2011)'s findings is that vulnerable narcissism will be associated with neither acquisitiveness nor apprehensiveness. As with prediction (1) from this study, this may be the case with some conflict manipulation conditions and not others. The "ambiguous" condition from this study most closely reflects the instructions provided in the study by Miller and colleagues to their participants.

## Method

### *Participants*

Three hundred and twelve participants were recruited from the university's research participation pool consisting of undergraduate students enrolled in psychology courses. The mean age was 18.97 years old, *SD* = 1.97. Two-hundred-and-forty-nine participants were female (79.2% of the sample), 61 participants were male (19.9%), and two participants identified their gender as "other" (0.7%). Most of the sample identified their ethnicity as White (64.8%), with South Asian and Southeast Asian as the second and third most common ethnicities reported (14.3% and 7.2%, respectively). Fewer than 5% of participants reported their ethnicity in each of the other categories.

***Procedure***

Participants were recruited in groups of four, although all four participants did not always attend each session. In an ideal scenario, where four participants came to the session, they were randomly assigned to pairs or "dyads" for completing the study. Prior to each study session, each participant-pair was randomly assigned to a condition, either a competitive condition, a cooperative condition, or an ambiguous condition; and they were also randomly assigned a four-digit code, which was used to link their Qualtrics data to their fishing simulation data. This ensured that both people playing in a simulation had received the same instructions, to lessen frustration or confusion about the other person's strategy. When an odd number of participants came to the session, the remaining participant was paired with a computer partner, although they were not informed of this until after the study ended[3]. Whether it was a real partner or a computer partner, the simulation looked the same to participants – it appeared as though there were two people playing in the simulation. Participants completed all aspects of the study in individual cubicles with no other participants in eyesight; the pairing only pertained to the task which was completed over the computer.

When participants arrived in the lab, they were given a brief introduction to the study, where it was implied that they would be playing with another study participant. Specifically, they were told that when they pressed "go fishing" on the fishing simulation, it may not begin immediately because they would be playing with another person who may not be ready to play yet. They were not, however, told which participant they would be playing with. Specific

[3] A total of 24 (7.82%) participants played the Commons Dilemma task with a computer partner. Analyses were conducted with these participants' data removed, and it did not change the significance or direction of significance for the results. As such, this distinction is not further discussed in the results section.

instructions about how to complete the questionnaires and task were delivered on the computer by text and video, once participants were in their individual cubicles.

First, participants completed the demographics questionnaire, the Five Factor Narcissism Inventory (FFNI-SF; Sherman, et al., 2015), the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1975), the Ten Item Personality Inventory (TIPI, Gosling, et al., 2003), the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back, et al., 2013), and the Preference for Consistency Scale (PFC; Cialdini, et al., 1995).

Then they received their condition-specific written instructions. The competitive condition instructions informed participants that they were playing *against* the other person, such that they would only be granted points if they harvested more fish than the other person. The cooperative condition instructions informed participants that they were playing *with* the other person for joint points that they would both receive at the end, where both members of the dyad would receive the same number of points which was based on the number of fish they both took added together. The ambiguous condition informed participants that there was another person playing but it was not indicated how points were allotted. Participants in all conditions were told that points could be exchanged for raffle tickets for a $50 gift card. In reality, all participants received one entry to the raffle regardless of their performance.

After receiving the condition-specific instructions, participants watched a video embedded in the Qualtrics survey explaining the general mechanics of the fishing game. Along with this video, they were asked to answer the questions posed in the video on their Qualtrics survey to ensure comprehension of how to play (exact questions and video can be found in Appendix D). The questions related to the mechanics of the game, such as a question about how many fish would remain in the next season based on how many fish were taken in the previous

season. Participants needed to understand this information in order to make informed choices about how they wanted to fish. Then, they were asked to indicate their perceptions of the game. This included a version of the conflict, power, and mutual dependence subscales of the Situational Interdependence Scale (SIS) intended to measure participants' perceptions of conflict, power, and mutual dependence present in the game before they played it (labelled as $SIS_{pre}$ to distinguish from the same questionnaire which participants completed again after they played the game) and also strategy questions reflecting how they planned to behave during the game.

At this point, participants were instructed to play the game. The game used in this study is a fishing simulator Commons Dilemma game developed by Gifford Lab (Gifford & Gifford, 2002). The simulation allows for games to be played with multiple participants or for one participant to play with computer-simulated players, whose behaviour can also be customized. For the purpose of this study, the game was played between two real players, or if an uneven number of participants arrived for the study, then one of the participants in that session played with a computer-simulated partner. The instructions that were given to participants for how to play the game differed between conditions similarly to Study 1, where points in the competitive condition were either given to one player or the other, points in the cooperative condition were shared between players, and the distribution of points remained ambiguous in the ambiguous condition (see Appendix D for complete instructions). Points in each case related to the number of fish each player harvested.

The game was played by clicking on the fish that a participant would like to take. There were seven seasons which each lasted 60 seconds (or until the stock of fish was depleted by players). Players could view their own score as well as the other players' scores, so they could

adjust their fishing behaviour based on the remaining stock or how other participants were playing. The ocean began with 40 fish in it. The remaining fish when a season ended were doubled (to simulate breeding), such that if there were 12 fish remaining after season one, there would be 24 fish in season two.

The program allows for the computer player to be programmed from a 0 to 100 "greediness" level. At 0% greediness, it will take no fish; at 100% greediness, it will take all of the fish. If there was an odd number of participants during a given study session, one of them would play against the computer. For this study, the computer player was set to have a 50% greediness level – thus always taking approximately a quarter ±2 of the fish remaining, to allow for the fish stock to replenish fully. It did not always take exactly a quarter, probably to increase believability that it was a real person fishing, but it never depleted the fish stock. Occasionally, the program took considerably less than a quarter of the fish, because when a participant took a large number of fish very quickly, the program did not increase the speed with which it fished.

After the game, participants completed another version of the conflict, power, and mutual dependence scales from the SIS ($SIS_{post}$) to indicate how they experienced the conflict, power, and mutual dependence while playing the game. Finally, they did a short debriefing questionnaire to check if anyone correctly guessed the hypothesis, and an attention check question that simply asked if they thought their data should be used.

***Measures***

Several of the same measures from Study 1 were also used in this study. These are the Rosenberg Self Esteem Scale, the Ten Item Personality Inventory, the Narcissistic Admiration and Rivalry Questionnaire (NARQ; $\alpha_{total} = .834$, $\alpha_{admiration} = .821$, $\alpha_{rivalry} = .810$), the Preference for Consistency Scale, and the debriefing questionnaire. All new measures are described below.

**Five Factor Narcissism Inventory.** Narcissism was measured using the short-form Five Factor Narcissism Inventory (FFNI-SF; Sherman, et al., 2015) which consists of 60 items rated from 1 (strongly disagree) to 5 (strongly agree). The FFNI includes 15 different facets which consist of four questions each: acclaim seeking, arrogance, authoritativeness, distrust, entitlement, exhibitionism, exploitativeness, grandiose fantasies, indifference, lack of empathy, manipulativeness, need for admiration, reactive anger, shame, and thrill seeking. These facets can be combined into subscales that reflect either a two- or three-dimensional model of narcissism. The two-dimensional model reflects grandiose versus vulnerable narcissism. The benefit of having the three-dimensional model as well is it allows for aspects of both grandiose and/or vulnerable narcissism to be separated, to get a more detailed picture of the which narcissistic traits are related to which outcomes. The FFNI-total was correlated to the NARQ-total, $r = .78$, $p < .001$.

***Two-dimensional model.*** The two-dimensional scoring has subscales reflecting grandiose narcissism ($\alpha = .90$) and vulnerable narcissism ($\alpha = .75$). Of the 15 facets, 11 reflect grandiose narcissism (indifference, exhibitionism, authoritativeness, grandiose fantasies, manipulativeness, exploitativeness, entitlement, lack of empathy, arrogance, acclaim seeking, and thrill seeking; the other four facets reflect vulnerable narcissism (reactive anger, shame, need for admiration, and distrust). In this study, grandiose narcissism is reflected in the FFNI-grandiose subscale and additionally by the NARQ-total subscale (described in detail for Study 1). The FFNI-grandiose was significantly correlated with the NARQ-admiration subscale, $r = .70$, $p < .001$, and with the NARQ-rivalry subscale, $r = .51$, $p < .001$. The FFNI-vulnerable was not significantly correlated with the NARQ-admiration subscale, $r = .10$, $p = .094$, but it was with the NARQ-rivalry subscale, $r = .45$, $p < .001$.

***Three-dimensional model.*** The alternate three-dimensional scoring system reflects antagonism ($\alpha$ = .80), agentic extraversion ($\alpha$ = .65), and narcissistic neuroticism ($\alpha$ = .78). The 15 facets are split between these three subscales and have overlap with the two-dimensional model as well. For example, narcissistic neuroticism is comprised of shame, indifference (reversed), and need for admiration. This has two overlapping facets with the vulnerable narcissism subscale (shame and need for admiration). The remaining facet, the reversed indifference facet does not overlap with either of the two-dimensional subscales ("indifference" is present in the grandiose narcissism subscale, but it is not reversed). Agentic extraversion can be represented by both the FFNI-extraversion subscale and the NARQ-admiration subscale. Antagonism can be represented by both the FFNI-antagonism and the NARQ-rivalry subscale. Agentic extraversion is unique to grandiose narcissism, narcissistic neuroticism is unique to vulnerable narcissism, and antagonism is relevant for both grandiose and vulnerable narcissism.

The FFNI-antagonism measure was significantly correlated to both the NARQ-admiration and rivalry subscales, $r$ = .50, $p$ <.001; $r$ = .67, $p$ <.001, respectively. The FFNI-extraversion measure was also significantly correlated with both NARQ subscales, $r$ = .74, $p$ <.001 with admiration and $r$ = .25, $p$ <.001 with rivalry. Finally, the FFNI-neuroticism measure was negatively correlated with the NARQ-admiration subscale, $r$ = -.16, $p$ = .005, and positively correlated with the NARQ-rivalry subscale, $r$ = .19, $p$ = .001.

**Situational Interdependence Scale.** The same three subscales from the Situational Interdependence Scale (SIS) were used in Study 2 as were used in Study 1, but there were two versions of them. The first version was the same as the one described in the "Measures" section for Study 1 ($SIS_{pre}$); the second version was a past-tense version of this ($SIS_{post}$). For example, the first version asked, "The other prefers different outcomes than I do in this situation", whereas

the second version asked, “The other preferred different outcomes than I did in this situation”. The $SIS_{pre}$ had a Cronbach’s alpha of .828, and the $SIS_{post}$ had a Cronbach’s alpha of .933.

**Strategy Questionnaire.** A strategy questionnaire was created for this study, based, in part, on questions in the study completed by Campbell and colleagues (2005). It asked participants how much they planned to adopt a strategy to maximize their own earnings versus ensure the stock is not reduced to zero (reflecting acquisitiveness), and how much they thought the other person would plan to adopt each of those strategies (reflecting apprehensiveness). Four of these questions were answered on a 5-point scale from “not at all” to “all of the time”, except for two. An example of one of the 5-point scale questions is “To what extent do you plan to adopt a strategy of maximising your own earnings?” One of the questions was a dichotomous question that says “Once the fishing simulation begins, which strategy, in general, do you intend to adopt?” with “maximize my own earnings” and “ensure the stock of fish is not reduced to zero” as the two options. The other question was a sliding scale from 0 to 100 with the question “If all students on campus participated in this study, what percentage do you think would choose to maximize their own earnings?”. In the analyses presented later, the dichotomous acquisitiveness question and the sliding scale apprehensiveness question are presented as outcomes on their own. The two acquisitiveness Likert questions were combined into another outcome ($\alpha = .610$) and the two apprehensiveness Likert questions were combined into an outcome ($\alpha = .504$). To create these aggregated outcomes, one item had to be reversed scored for each aggregated outcome. In total there are four outcomes analyzed in the Results section below – two for both acquisitiveness and for apprehensiveness.

## Results

### *The Effect of Condition on Perceptions of Conflict*

As in Study 1, perceptions of conflict were manipulated using different instructions about the allotment of points and the relationship between the participant and the other person (either an opponent or a partner or an unspecified relationship). A one-way ANOVA found that perceived conflict significantly differed by condition for both the $SIS_{pre}$ (completed before participants played the game) and for the $SIS_{post}$ (completed after participants played the game), $F$ (2, 304) = 24.357, $p$ <.001 and $F$ (2, 304) = 20.711, $p$ <.001, respectively. There were significant differences between all of the conditions. For the $SIS_{pre}$, participants perceived greater conflict in the competitive condition ($M$ = 4.470, $SD$ = 1.066) relative to the cooperative condition ($M$ = 3.434, $SD$ = 1.067), $t$ (304) = 6. 909, $p$ <.001, and in the competitive condition relative to the ambiguous condition ($M$ = 3.828, $SD$ = 1.121), $t$ (304) = 4.225, $p$ <.001. Participants in the ambiguous condition also perceived greater conflict than participants in the cooperative condition, $t$ (304) = 2.579, $p$ = .031.

Perceived conflict after the game differed similarly between conditions, but overall, participants perceived greater conflict after playing the game than they did before, $t$ (304) = -3.404, $p$ = .001. Perceived conflict after the game ($SIS_{post}$) was higher in the competitive condition ($M$ = 4.923, $SD$ = 1.168) than the cooperative condition ($M$ = 3.702, $SD$ = 1.441), $t$ (304) = 6.398, $p$ <.001, and than the ambiguous condition ($M$ = 4.200, $SD$ = 1.507), $t$ (304) = 3.738, $p$ = .001. Perceived conflict was also higher in the ambiguous condition than the cooperative condition, $t$ (304) = 2.567, $p$ = 032.

***Predicting Perceptions of Conflict***

The following results are from the $SIS_{pre}$ because that is the measure which was completed before the game was played; the $SIS_{post}$ would reflect perceptions participants formed after playing, which may have been influenced by how the other member of the dyad played. To

test hypothesis 1, that there would be a main effect of narcissism on perceptions of conflict, linear regression analyses were used. Based on the results of the linear regression analyses, the measures of narcissism specifically associated with antagonism predicted perceptions of conflict, such that individuals higher in narcissism perceived greater conflict than individuals lower in narcissism prior to fishing (see Tables 3a-c). There were multiple interactions as well, which are explored further below, in figures 6-9. These interactions relate to hypothesis 2, that there would be a greater effect of narcissism on perceptions of conflict in the ambiguous condition compared to the competitive or cooperative conditions.

Decomposing the interaction between NARQ-admiration and condition (Figure 6), using simple slope analyses, the negative slope of the competitive condition is significant, ß = -.216, $t$ = -2.213, $p$ = .028, such that those in the competitive condition who were high in agentic extraversion perceived significantly less conflict than those who were low in agentic extraversion, using the NARQ-admiration subscale. Neither the cooperative nor ambiguous conditions had a significant slope, ß = .105, $t$ = 1.182, $p$ = .238, and ß = .075, $t$ = .831, $p$ = .406, respectively.

Using simple slope analyses to decompose the interaction between FFNI-extraversion and condition (Figure 7), the negative slope of the competitive condition is significant, ß = -.303, $t$ = -3.475, $p$ = .001, such that those in the competitive condition who were high in agentic extraversion perceived significantly less conflict than those who were low in agentic extraversion, using the FFNI-extraversion subscale. Neither the cooperative nor ambiguous conditions had a significant slope, ß = .101, $t$ = 1.064, $p$ = .288, and ß = .085, $t$ = .923, $p$ = .357, respectively.

Using simple slope analyses to decompose the interaction between FFNI-vulnerable and condition (Figure 8), the slope for the ambiguous condition was significant, ß = .351, $t$ = 3.860, $p$ <.001, where those high in vulnerable narcissism perceived significantly greater conflict than those low in vulnerable narcissism in the ambiguous condition. The slopes for the competitive and cooperative conditions were not significant, ß = -.036, $t$ = -.377, $p$ = .706; ß = .079, $t$ = .922, $p$ = .357, respectively.

Like the slopes for the FFNI-vulnerable subscale, the slope in the ambiguous condition was significant for the FFNI-neuroticism subscale (Figure 9), ß = .323, $t$ = 3.736, $p$ <.001, where those high in narcissistic neuroticism perceived significantly more conflict than those low in narcissistic neuroticism in the ambiguous condition. This effect was not present for the competitive or cooperative conditions, ß = -.093, $t$ = -.975, $p$ = .330; ß = .001, $t$ = .006, $p$ = .995, respectively.

***Fishing Behaviour: Seasons Before Resource Depletion by Dyad***

The following three sections of the results pertain to hypothesis 3, that participants high in narcissism would fish more exploitatively in the Commons Dilemma task. Since participants were nested in dyads, I conducted mixed model linear analyses following the procedure by Kenny (2015), to control for non-independence. Participant narcissism was not significantly related to the number of seasons completed for any of the measures of narcissism, but there were significant interactions between narcissism and condition for measures pertaining to grandiose narcissism (NARQ-total and FFNI-grandiose), agentic extraversion (NARQ-admiration and FFNI-extraversion), and antagonism (NARQ-rivalry and FFNI-antagonism). Tables 4a-c and the graphs in Figures 10-15 display these results.

When considering the measures with a significant interaction in Table 4a (NARQ-total and FFNI-grandiose), there was a significant difference between the slope of the competitive and cooperative conditions, but not between the competitive and ambiguous conditions for both measures. There was also a marginal difference between the simple slopes in the cooperative and ambiguous conditions, $t = 1.879$, $p = .062$ (NARQ-total) and $t = 1.876$, $p = .062$ (FFNI-grandiose). For the NARQ-total measure, simple slope analyses suggest that none of the simple slopes were significant, however (Figure 10). For the FFNI-grandiose, a simple slope analysis showed that the simple slope in the cooperative condition was significant, $ß = -.332$, $t = -3.216$, $p = .001$, such that individuals high in grandiose narcissism completed significantly fewer seasons than did those low in grandiose narcissism (Figure 11). The slopes in the competitive and ambiguous conditions were not significant, $ß = -.063$, $t = -.750$, $p = .454$ and $ß = -.116$, $t = -1.295$, $p = .196$, respectively.

Next, considering the significant interactions for the measures of agentic extraversion (Table 4b; NARQ-admiration and FFNI-extraversion), there was a significant difference between the competitive and cooperative conditions for both measures, but not between the competitive and ambiguous conditions. There was no difference between the slopes in the cooperative and ambiguous conditions, for either measure, $t = 1.584$, $p = .115$ (NARQ-admiration) and $t = 1.392$, $p = .166$ (FFNI-extraversion). A further simple slope analysis showed that none of the slopes were significant for the NARQ-admiration (Figure 12), but for the FFNI-extraversion, simple slopes analyses found that the cooperative condition slope was significant, $ß = -.243$, $t = -2.615$, $p = .009$, such that individuals high in agentic extraversion measured by the FFNI-extraversion were able to complete fewer seasons before depleting the resource than individuals low in agentic extraversion in the cooperative condition (Figure 13). The competitive and ambiguous

condition slopes were not significant, ß = .077, *t* = .838, *p* = .402 and ß = -.111, *t* = -1.201, *p* = .231, respectively.

Finally, considering the significant interactions from Table 4c for measures of antagonism (NARQ-rivalry and FFNI-antagonism), there was a significant difference between the slopes in the competitive and cooperative conditions but not between slopes in the competitive and ambiguous conditions for both measures. Further, there was a marginal difference between slopes in the cooperative and ambiguous conditions for the NARQ-rivalry, *t* = 1.789, *p* = .075, but no difference in slopes between the cooperative and ambiguous conditions for the FFNI-antagonism, *t* = 1.654, *p* = .100. Simple slopes analysis revealed that the slope in the cooperative condition was marginally significant, ß = -.173, *t* = 1.762, *p* = .079 for NARQ-rivalry (Figure 14) and significant for FFNI-antagonism (Figure 15), ß = -.272, *t* = 2.391, *p* = .017, such that individuals high in antagonism measured by the FFNI-antagonism measure completed fewer seasons before depleting the resource than individuals low in antagonism did in the cooperative condition. The slopes of the competitive and ambiguous conditions were not significant, ß = .106, *t* = 1.118, *p* = .264 and ß = -.037, *t* = -.430, *p* = .668 (NARQ-rivalry); ß = -.060, *t* = -.272, *p* = .468 and ß = -.094, *t* = -1.066, *p* = .287, respectively.

Testing whether individuals who perceive greater conflict completed fewer seasons, there was a significant correlation between perceptions of conflict before the game was played ($SIS_{pre}$) by individuals and the number of seasons completed before depletion by dyads, *r* = -.162, *p* = .005. There were also correlations between fishing motivations (acquisitiveness and apprehensiveness) and the number of seasons completed until depletion, see Table 5.

***Fishing Behaviour: Total Fish Taken in First Season***

The same dyadic mixed model linear analysis approach was taken to test if narcissism, condition, and the interaction predicted total fish taken in the first season. The number of fish taken in the first season may be a relatively clear measure of exploitative behaviour, because all participants face the same choice in the first season (because everyone begins with a stock or 40 available fish) and have had no prior exposure to their partner's fishing behaviour. There was a main effect of condition, such that more fish were taken in the first season by participants in the competitive condition compared to the cooperative condition, $t$ (304) = 4.131, $p$ <.001, and in the ambiguous condition compared to the cooperative condition, $t$ (304) = 3.387, $p$ = .002. There was also a main effect of narcissism for measures primarily related to grandiose narcissism (i.e.., NARQ-admiration, FFNI-grandiose, FFNI-antagonism), but not those related to vulnerable narcissism, see Table 6 for these analyses. Two measures related to grandiose narcissism, the FFNI-extraversion and NARQ-rivalry did not show significant relations, though their relations were positive descriptively. The association for the FFNI-neuroticism was weak and negative.

There was one marginally significant interaction for NARQ-admiration, $t$ (278.729) = -1.918, $p$ = .056. Figure 16 shows this pattern.

There was also a significant correlation between individual's perceived conflict before the game was played with the number of fish taken in the first season, $r$ = .225, $p$ <.001. There were correlations between the number of fish taken in the first season and fishing motivations too, displayed in Table 7.

***Fishing Behaviour: Total Fish Taken***

Total fish taken refers to the total number of fish that a participant took over the course of their game. For some participants the total number was only taken in one season (because the dyad depleted the resources in one season) whereas for other participants, it was taken across up

to seven seasons, depending on how many seasons the dyad maintained the fish stock. This number, however, reflects how successful participants were in personally harvesting fish across all possible seasons.

There was a main effect of condition, such that participants in the competitive condition took significantly more than participants in both the ambiguous ($t$ (170.005) = 2.317, $p$ = .022) and cooperative conditions ($t$ (181.386) = 5.405, $p$ <.001), and participants in the ambiguous condition took more fish total than participants in the cooperative condition, $t$ (169.459) = 2.929, $p$ = .004. Figure 17 and Tables 8a-c display these results.

There was no significant main effect of narcissism, regardless of narcissism measure used, and there were also no significant interactions.

Finally, there was a significant correlation between perceived conflict before the game was played and total fish taken, $r$ = -.136, $p$ = .017. There were also correlations between total fish taken and motivations for fishing behaviour, displayed in Table 9.

Supplemental analyses regarding restraint and efficiency during fishing seasons are discussed in Appendix E since no specific hypotheses were made about them. Restraint and efficiency were two outcomes that were calculated by the fishing program and reflected how many fish participants took in relation to how many fish were remaining.

***Motivations for Fishing Behaviour***

Motivations for fishing behaviour (acquisitiveness and apprehensiveness) were measured by six questions in total, to address hypothesis 4. "Acquisitiveness" is represented by one dichotomous question and one aggregate of two Likert scale questions for a total of two different outcome variables; "apprehensiveness" is represented by one sliding scale question and one aggregate of two Likert scale questions, also for a total of two different outcome variables.

Linear regression analyses were conducted to test whether participants' motivations for how they intended to fish in the game were affected by their level of narcissism, first using the dichotomous acquisitiveness item and the sliding scale apprehensiveness item. Almost all of the measures of narcissism (NARQ-total, NARQ-admiration, FFNI-total, FFNI-grandiose, FFNI-vulnerable, FFNI-antagonism, and FFNI-extraversion) significantly predicted both desire to increase one's own profits (acquisitiveness) and belief that others also plan to maximize their own profits (apprehensiveness), with two exceptions. NARQ-rivalry predicted acquisitiveness, *ß*= .234, $p$ <.001, but not apprehensiveness, ß= .068, $p$ = .225. FFNI-neuroticism did not significantly predict either acquisitiveness or apprehensiveness. Figure 18 shows a typical pattern, and Tables 10a-c and 11a-c show the statistics associated with each of the measures of narcissism.

There were no significant interactions. Since there were no significant interactions, a one-way ANOVA was conducted to test if there was a main effect of condition on fishing motivation. There was a significant effect of condition on both acquisitiveness, $F$ (2, 304) = 9.759, $p$ <.001, and apprehensiveness, $F$ (2, 304) = 5.653, $p$ = .004. Both acquisitiveness and apprehensiveness were higher in the competitive condition than the cooperative condition. Acquisitiveness was also higher in the competitive condition than the ambiguous condition, but apprehensiveness did not differ between these conditions – statistics are displayed in Table 12. Table 13 displays the means and standard deviations for these comparisons.

The pattern of results for the individual Likert scale items were similar to those of the dichotomous question and sliding scale question, with some notable differences for which the statistics are provided next. In the two-dimensional model of narcissism, both measures of grandiose (NARQ-total and FFNI-grandiose) and the one measure of vulnerable narcissism

(FFNI-vulnerable) were significantly related to both acquisitiveness and apprehensiveness, although there was a significant interaction with condition for FFNI-vulnerable, $R^2$-*change* = .020, $p$ = .038 – see Figure 19.

Subsequent simple slope analyses revealed that there was a significant slope for the competitive condition, ß = .271, $t$ = 2.721, $p$ = .007, where those high in vulnerable narcissism experienced greater apprehensiveness than those low in vulnerable narcissism did in the competitive condition. The slopes for the cooperative and ambiguous conditions were not significant.

For the three-dimensional model, both measures of agentic extraversion (NARQ-admiration and FFNI-extraversion) were significantly related to acquisitiveness, , ß = .150, $t$ = 2.690, $p$ = .008 and ß = .183, $t$ = 3.293, $p$ = .001, but not apprehensiveness, ß = .043, $t$ = .776, $p$ = .439 and ß = .081, $t$ = 1.451, $p$ = .148 (apprehensiveness).

Both measures of antagonism (NARQ-rivalry and FFNI-antagonism) were significantly related to acquisitiveness and apprehensiveness. There was one interaction with condition for NARQ-rivalry for apprehensiveness, $R^{2\text{-change}}$ = .018, $p$ = .046 – see Figure 20.

Similar to the interaction for the FFNI-vulnerable, simple slope analyses revealed that there was a significant slope for the competitive condition, ß = .340, $t$ = 3.613, $p$ <.001, where those high on the NARQ-rivalry subscale reported greater apprehensiveness than did those low on the NARQ-rivalry subscale in the competitive condition. The ambiguous and cooperative slopes were not significant.

Finally, narcissistic neuroticism (measured by FFNI-neuroticism) did not predict either acquisitiveness or apprehensiveness, and there were no interactions.

**Discussion**

This study aimed to test the two hypotheses from Study 1, that people high in narcissism perceive greater amounts of social conflict than people low in narcissism, and that this effect might be affected by the amount of ambiguity about the conflict present (a more tentative prediction after Study 1 did not find support for it). It also aimed to extend those findings into behavioural outcomes; with the hypothesis that people high in narcissism would behave more exploitatively in a social dilemma game (the Commons Dilemma). Finally, there were different predictions for the motivations behind the exploitative behaviour. Individuals high in grandiose narcissism would be motivated by *acquisitiveness* – the desire to maximize one's own profits – whereas individuals high in vulnerable narcissism would be motivated by *apprehensiveness* – the fear that others will exploit the common resource. Alternatively, it could be that since the Commons Dilemma is played by taking resources for personal gain rather than contributing resources as personal cost (as in a Public Goods Dilemma, for example), acquisitiveness would be highlighted over apprehensiveness, resulting in the exploitative behaviour being primarily associated with grandiose narcissism, and not vulnerable narcissism.

***Perceptions of Conflict***

Perceptions of conflict significantly differed between conditions. As the manipulation was intended, people in the competitive condition perceived higher amounts of conflict than people in the cooperative condition, with people in the ambiguous condition perceiving conflict in between the amount of the competitive and cooperative conditions. This indicates that the conflict manipulation was successful in manipulating conflict.

With respect to the hypothesis that more narcissistic participants would perceive greater conflict than less narcissistic individuals, measures associated with antagonism (NARQ-rivalry and FFNI-antagonism) directly predicted greater perceptions of conflict across all conditions.

The only facet of narcissism that these two measures share is *reactive anger* (and none of the other FFNI subscales contain this facet), which is comprised of items such as “It really makes me angry when I don’t get what I deserve”, and “I hate being criticized so much that I can’t control my temper when it happens”. The NARQ-rivalry contains items like “I often get annoyed when I am criticized” and “I react annoyed if another person steals the show from me”, which are quite similar to the FFNI reactive anger items. It could be that this sort of *reactive anger* or *antagonistic* trait is primarily what is driving the effect of those higher in these measures of narcissism to perceive greater conflict than those lower in them, across all conditions in this study.

There were significant interactions for dimensions associated with agentic extraversion and narcissistic neuroticism in predicting perceptions of conflict. Contrary to predictions, for measures associated with agentic extraversion (NARQ-admiration and FFNI-extraversion) those high in this dimension perceived less conflict in the competitive condition than those low on the subscale, but the opposite pattern was true for the cooperative and ambiguous conditions (though the slopes were not significant). Within this pattern, participants low on the NARQ-admiration and FFNI-extraversion subscales perceived greater differences in conflict between the three conditions than did participants high on this subscale (see Figures 4 and 7).

A different pattern of interaction emerged for the FFNI-vulnerable subscale and, specifically the FFNI-neuroticism subscale. Participants high and low in vulnerable narcissism/narcissistic neuroticism had similar perceptions of the degree of conflict in the cooperative and competitive conditions, but those high in vulnerable narcissism/narcissistic neuroticism perceived a greater degree of conflict in the ambiguous condition than did those low in vulnerable narcissism/narcissistic neuroticism (see Figures 6 & 8). This result is interesting

because it suggests that those high in vulnerable narcissism perceived the amount of conflict about the same as those low in vulnerable narcissism when the degree of conflict was explicitly high or low, but when it remained ambiguous, they were biased to perceive greater conflict.

These results highlight the importance of considering the three-dimensional model of narcissism because the three dimensions (agentic extraversion, antagonism, and narcissistic neuroticism) had very different results. The FFNI-antagonism subscale was associated with greater perceptions of conflict overall, the FFNI-neuroticism subscale was associated with greater perceptions of conflict in the ambiguous condition, and the FFNI-extraversion subscale was mostly unrelated to perceptions of conflict, except for significantly lower perceptions of conflict in the competitive condition only.

***Fishing Behaviour***

Exploitative fishing behaviour was measured through two different outcome variables. There was a consistent effect of condition, particularly between the competitive and cooperative conditions, on these measures. Furthermore, there was evidence that participants higher in grandiose narcissism tended to behave more exploitatively in the Commons Dilemma fishing task. Specifically, individuals higher in grandiose narcissism took more fish in the first season than did individuals lower in grandiose narcissism. For the outcome of the number of seasons until depletion, the measures associated with grandiose narcissism had an interaction where they those high in grandiose narcissism were more likely to fish exploitatively in the cooperative condition, but not the ambiguous and competitive conditions. Overall, it was measures related to grandiose narcissism that tended to predict more exploitative fishing behaviour more than measures related to vulnerable narcissism for both the number of seasons completed before depleting the stock of fish and the number of fish taken in the first season. There was one

exception to this which was the FFNI-extraversion measure which was not significantly associated to number of fish taken in the first season. This matches the finding that those high in agentic extraversion perceived less conflict than those low in it, however it is contrary to the original hypotheses since agentic extraversion is associated with grandiose narcissism. This finding might be consistent with research that has found agentic extraversion to be a more adaptive aspect of narcissism than the other facets though (Jauk & Kaufman, 2018).

Interestingly, no measure of narcissism significantly predicted total fish taken. This indicates that although participants higher in grandiose narcissism tended to fish more exploitatively than participants lower in grandiose narcissism, this strategy was not particularly successful for maximizing profits. Those high in narcissism may have thought that they performed better than others in this task (this was not measured, however, previous research suggests that those high in narcissism tend to believe they perform better than others, e.g., Krizan & Bushman, 2010), but if so, this would be an inaccurate belief.

***Motivations for Fishing Behaviour***

This study aimed to replicate previous findings (Campbell, et al., 2005; Miller, et al., 2011) that people high in grandiose narcissism would be motivated by acquisitiveness rather than apprehensiveness. It also aimed to expand on those findings by considering the possibility that vulnerable narcissism may be motivated differently depending on conflict manipulation. Instead, participants high in narcissism measured by almost all the scales used were high in both acquisitiveness and apprehensiveness. When looking at the single-item (dichotomous and sliding scale questions), the exceptions were NARQ-rivalry, which only predicted high acquisitiveness and not apprehensiveness, and FFNI-neuroticism which predicted neither. When looking at the aggregate Likert items, measures of agentic extraversion (NARQ-admiration and

FFNI-extraversion) were both only significant for acquisitiveness, and not for apprehensiveness. This is more like the previous findings (Campbell, et al., 2005; Miller, et al., 2011) since these measures are aspects of grandiose narcissism – however the measures of grandiose narcissism overall (NARQ-total and FFNI-grandiose) were significant for both acquisitiveness and apprehensiveness. This might indicate that the effect of grandiose narcissism for apprehensiveness was driven primarily by antagonism which is part of vulnerable narcissism as well.

Neuroticism – the one subscale that was not significant for either acquisitiveness nor apprehensiveness - is the one aspect from the three-dimensional view of narcissism that is unique to vulnerable narcissism and not also present in grandiose narcissism. This suggests that the findings regarding acquisitiveness and apprehensiveness are primarily due to grandiose narcissism – or from the three-dimensional model, extraversion and antagonism. The measure of vulnerable narcissism was significantly related to both acquisitiveness and apprehensiveness, but breaking it down into the three-dimensional view, it seems that this is mostly due to antagonism, not neuroticism.

It is important to note that the measure for "apprehensiveness" did not include any items that specifically mentioned fear or worry. Instead, this measure was comprised of items such as "If all students on campus took this study, what percentage do you think would choose to maximize their own profits?" A person could respond with a high percentage to this question without specifically feeling worried about it. In line with the idea that a degree of projection of one's own personality traits onto others may affect perceptions of conflict, it could be that people who are strongly motivated by acquisitiveness may assume others are too, but without a feeling of worry associated with it that would reflect "apprehensiveness". It is possible, therefore, that

had the "apprehensiveness" items been worded with a greater emphasis on fear and worry, that the results for this item might have been lower for participants who are high in grandiose narcissism and higher for those high in vulnerable narcissism. Additionally, in the studies by Campbell and colleagues (2005) and Miller and colleagues (2011), their question of apprehensiveness asked if participants believed that the other participants were *more* focussed on earning a profit than they were, whereas the questions in this study simply asked to what extent participants believed the other participants intended to adopt a strategy to maximize their own earnings. Participants high in grandiose narcissism may have been less inclined to believe other participants wanted to profit *more* than they did, if they themselves were highly driven to profit. That would explain why grandiose narcissism was not related to apprehensiveness in the earlier studies but was in this one.

The results pertaining to fishing behaviour indicated that although it seemed to be people high in antagonism (which is common to both grandiose and vulnerable narcissism) who perceived high levels of conflict across all conditions, it was primarily those high in grandiose narcissism who behaved more exploitatively in the Commons Dilemma task, particularly in terms of the number of fish harvested in the first season. This means that although those high in vulnerable narcissism, relative to those low in vulnerable narcissism, may have perceived higher amounts of conflict in the ambiguous condition prior to starting the game, and after playing the game, they did not change their fishing choices to be more exploitative.

It is also worth noting that the Commons Dilemma task naturally highlights acquisitiveness more than apprehensiveness (or greed more than fear; Parks & Hubert, 1995; Yamagishi & Sato, 1986). Participants in this task is are tempted to take more of the resource for personal gain. It is a dilemma because taking all the resource results in the

end of the seasons, which ultimately reduces total profit; however, the only way to do well is to take *some* of the resource. This highlights acquisitiveness - the desire to maximize one's own profits. It could be that changing the focus of the game to more of a Public Goods Dilemma, where participants have to pay into a common resource instead of taking out of a common resource, could highlight apprehensiveness more, by focusing participants on fear of personal loss due to others' exploitation. This could promote exploitative behaviour in participants high in vulnerable narcissism more than the Commons Dilemma task does.

Both acquisitiveness and apprehensiveness were negatively correlated with the number of seasons until resource depletion, indicating that participants who reported greater acquisitiveness or apprehensiveness depleted the resource faster. It was also positively correlated with the number of fish taken in the first season. Combined these two results suggest that participants who were high in acquisitiveness or apprehensiveness fished more exploitatively than participants low in those motivations. Total fish taken was also positively related to acquisitiveness and apprehensiveness, although less strongly. This means that although participants high in these motivations took more fish in the first season than participants low in them, they did not necessarily do poorly in the fishing game overall.

## General Discussion

Combined, these two studies provide evidence that people high in narcissism—particularly grandiose narcissism—are biased to perceive a greater degree of social conflict than are people lower in narcissism. The results of Study 1 showed that those high in grandiose narcissism, particularly those high in admiration, perceived greater conflict, whereas the results of Study 2 indicated that it was the rivalry or antagonism aspect of grandiose narcissism that was most clearly related to perceptions of conflict across all conditions. The results thus suggest that

agentic extraversion (admiration) and antagonism (rivalry), which are both considered to be components of grandiose narcissism, are most clearly related to perceptions of conflict, although they differed across studies in their strength of association. This is a discrepancy which might be partly explained by the different tasks in the two studies. Study 1 utilized a word unscrambling game which could potentially be seen as reflective of talent or intellectual ability (although nothing of the sort was ever told to participants), whereas Study 2 utilized a fishing game which required little thinking. As such, it could be that those high in narcissistic admiration and extraversion, for instance, perceived greater conflict in Study 1 but not Study 2 because winning the Commons Dilemma task seemed like less of a self-aggrandizing achievement than winning the word-unscrambling task ("I won this because I was the most intelligent" versus "I won this because I took the most fish"). The interactions for vulnerable and neurotic narcissism in Study 2 provided some support that at least for those high in vulnerable and neurotic narcissism, the bias to perceive greater conflict may be more pronounced when the actual degree of conflict is ambiguous or not explicitly stated. This is interesting because most social situations do not have such explicit competitive or cooperative instructions, but rather the degree of conflict is left somewhat ambiguous. As such, this finding might be more informative for how more vulnerably narcissistic individuals may perceive conflict outside of a contrived lab setting.

Furthermore, Study 2 partially replicated previous findings (Campbell, et al., 2005; Miller, et al., 2011) that people high in grandiose narcissism tend to behave more exploitatively in a social dilemma task. The results also supported the finding of Miller and colleagues (2011) that such exploitative behaviour in a Commons Dilemma is primarily linked to grandiose narcissism and not vulnerable narcissism. That is interesting considering it was primarily those high in antagonism, and narcissistic rivalry who perceived greater conflict than those low in

those attributes, and antagonism has been suggested to be the common core of both grandiose and vulnerable narcissism (Krizan & Herlache, 2017; Miller et al., 2017). At a glance, this seems to be at odds with the framework that it is perceptions of conflict that drive exploitative behaviour by people high in narcissism. Narcissistic rivalry reflects antagonism, so it is still possible that it is specific aspects of both grandiose and vulnerable narcissism (perhaps "reactive anger") that drive the greater perceptions of conflict. That could mean that this finding is not specific to grandiose or vulnerable narcissism, but rather those who are high in that (rivalrous or antagonistic) aspect of narcissism.

The results from the acquisitiveness and apprehensiveness measures suggest that people high in grandiose narcissism (both agentic extraversion and antagonism) intend to maximize their own profits (which could be viewed as an intention to fish "exploitatively" in the context of a common resource game) and also expect that others intend to do the same, more so than people lower in grandiose narcissism do. This supports the idea that one possible reason for the finding that those high in narcissism tend to be highly competitive and exploitative may come from their expectations of how others will behave. These studies found that people high in narcissism relative to people low in narcissism, perceived more conflict, even when presented with what was intended to be a low-conflict situation, and that they also believed that others would behave more exploitatively just as they intended to do. The only aspect of narcissism for which this was not the case, was the narcissistic neuroticism aspect of vulnerable narcissism.

Overall, the results of this study suggest that it is important to consider narcissism through a multi-dimensional perspective. The results of this study varied through the grandiose versus vulnerable distinction, but the three-dimensional model and the admiration-rivalry distinctions provided even greater detail about what specifically may be driving these effects

regarding perceptions of conflict, motivations in a social dilemma, and behaviour in a social dilemma. The three-dimensional FFNI scoring (extraversion, antagonism, and neuroticism) provided particularly useful distinctions for how certain narcissistic traits relate to the outcomes measured.

### *Implications*

These two studies combined provided support for the hypothesis that people high in narcissism are biased to perceive greater conflict than people low in narcissism, and that this may be particularly the case when the degree of conflict is ambiguous for those who are high in vulnerable narcissism and its associated neuroticism aspect. Different aspects of narcissism may result in different perceptions of conflict depending on the nature of the conflict inherent to the situation. This has interesting implications for how people high in narcissism may view their social interactions with others on a day-to-day basis. If it is the case that those high in narcissism are perceiving high levels conflict, it may inform how they respond to others in situations which may not be inherently conflictual. They may behave in a highly competitive and exploitative manner due to their belief that this is how others are going to behave.

As seen through Study 2, there is potential for these perceptions of high conflict, even when the situation is relatively cooperative, to result in increased exploitative behaviour. Further, the exploitative behaviour may not even be particularly successful, since in this study, those high in grandiose narcissism took more fish in the first season and depleted the resources more quickly than those low in grandiose narcissism (at least in the cooperative condition), but they did not take more fish overall. This indicates that high perceptions of conflict may lead to more exploitative behaviour, but this is perhaps not an effective strategy even for increasing personal profit. This could have real-world consequences for social interactions that people high

in narcissism have. There are many situations which may seem low conflict, which could be interpreted as high conflict, by someone high in narcissism.

***Future Directions***

Future studies could further investigate the differences between acquisitiveness and apprehensiveness with a measure of apprehensiveness that more directly reflects worry about being exploited by others. The FFNI-neuroticism was not related to acquisitiveness and apprehensiveness, as assessed in Study 2, which may suggest that there is potential for those high in that element of narcissism to be more greatly motivated by worry than this study's design was able to capture.

It would also be interesting to expand the finding that people high in narcissism perceived more conflict than people low in narcissism to additional contexts. Both of the present studies tested this association with regard to a lab-setting game, where there was a potential to perform "well" (whether the individual interpreted "well" to be actually winning or simply to look better than other participants). Testing to see if people high in narcissism tend to interpret conflict in a non-game setting, such as a get-to-know-each-other activity in lab, for example, would give further insight into how prevalent these perceptions of high conflict might be for individuals high in narcissism. Since there were differences observed in perceptions of conflict between different forms of narcissism (e.g., grandiose versus vulnerable), it would also be interesting to identify what aspects of social situations may promote perceptions of higher conflict than lower conflict, for individuals high in different forms of narcissism.

It would additionally be interesting to further investigate the differences in exploitative behaviour between those high in grandiose narcissism and those high in vulnerable narcissism. The results of Study 2 suggest that features common to both grandiose and vulnerable narcissism

(e.g., rivalry and reactive anger) were associated with greater perceptions of conflict but it was primarily the measures of grandiose narcissism that were associated with exploitative behaviour. One possibility is that the Commons Dilemma naturally highlights acquisition more than apprehensiveness, or personal gains over personal losses. Because grandiose narcissism is associated with approach motivation—whereas vulnerable narcissism is associated with avoidance motivation (Krizan & Herlache, 2017)—the Commons Dilemma may be most motivating to individuals high in grandiose narcissism. Future studies could, therefore, test whether changing the focus of the social dilemma to highlight apprehension over acquisition may promote exploitative behaviour from those high in vulnerable narcissism.

### *Conclusion*

Results from these two studies suggest that people who are higher in narcissism tend to perceive greater social conflict than people who are lower in narcissism do. Furthermore, there was evidence in Study 2 that participants higher in grandiose narcissism may be inclined to fish more exploitatively, which could be in part promoted by their tendency to also view greater conflict than participants lower in grandiose narcissism. There were some differences from Study 1 to Study 2 in terms of the patterns that different subscales of narcissism had for perceptions of conflict. That, along with the differences observed from the two-dimensional and three-dimensional models of narcissism considered in Study 2, highlight the necessity of viewing narcissism in a multifaceted way.

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## Tables

*Note:* To return to the section of the text that referred to a specific table, click on the table #

**Table 1**

*Different wording by condition (competitive, cooperative, and ambiguous)*

| **Conflict** | **Cooperative** | **Ambiguous** |
|---|---|---|
| Please wait while the other participant chooses their answer. | Please wait while your partner chooses an answer. | Please wait while your partner chooses an answer. |
| You scored 3 points. The other participant scored 2 points. | You and your partner scored 5 points. | You scored 3 points. Your partner scored 2 points. |

**Table 2**

*ß and p values for linear regressions predicting SIS-conflict from participant narcissism and condition*

| **Participant narcissism** | **NARQ – total** | | | **NARQ – admiration** | | | **NARQ – rivalry** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| | .197 | 3.822 | <.001 | .219 | 4.399 | <.001 | .090 | 1.746 | .082 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .038 | | .001 | .035 | | .001 | .036 | | .001 |
| **Interaction** | .002 | | .615 | .012 | | .095 | .003 | | .611 |

**Table 3a**

*Regression of perceptions of conflict on the two-dimensional narcissism model (grandiose vs vulnerable narcissism)*

| **Participant narcissism** | **NARQ – total** | | | **FFNI-grandiose** | | | **FFNI-vulnerable** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| | .059 | 1.110 | .268 | .065 | 1.229 | .220 | .131 | 2.512 | .013 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .136 | | <.001 | .136 | | <.001 | .140 | | <.001 |
| **Interaction** | .009 | | .221 | .015 | | .072 | .025 | | .010 |

**Table 3b**

*Regression of perceptions of conflict on the three-dimensional narcissism model (agentic extraversion)*

| **Participant narcissism** | **NARQ-admiration** | | | **FFNI-extraversion** | | |
|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* |
| | -.012 | -.226 | .821 | -.039 | -.742 | .459 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .137 | | <.001 | .140 | | <.001 |
| **Interaction** | .020 | | .030 | .036 | | .002 |

**Table 3c**

*Regression of perceptions of conflict on the three-dimensional narcissism model (antagonism, and neuroticism)*

| **Participant narcissism** | **NARQ-rivalry** | | | **FFNI-antagonism** | | | **FFNI-neuroticism** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| | .113 | 2.132 | .034 | .134 | 2.530 | .012 | .077 | 1.462 | .145 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .139 | | <.001 | .138 | | <.001 | .148 | | <.001 |
| **Interaction** | <.001 | | .927 | .008 | | .232 | .033 | | .003 |

**Table 4a**

*Predicting the number of seasons before depletion from narcissism (grandiose and vulnerable narcissism) with a mixed model method*

| | **NARQ-total** | | | **FFNI-grandiose** | | | **FFNI-vulnerable** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .197 | 1.455 | .148 | .008 | .061 | .951 | -.063 | -.319 | .750 |
| **Competitive vs Cooperative** | .217 | 3.615 | <.001 | .219 | 3.637 | <.001 | .056 | 1.356 | .177 |
| **Competitive vs Ambiguous** | .068 | .859 | .392 | .072 | .919 | .359 | -.015 | -.190 | .849 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | -.322 | -3.535 | .001 | -.312 | -3.557 | <.001 | .162 | 1.164 | .246 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.191 | -1.643 | .102 | -.128 | -1.060 | .291 | -.071 | -.477 | .634 |

**Table 4b**

*Predicting the number of seasons before depletion from narcissism (agentic extraversion) with a mixed model method*

| | **NARQ-admiration** | | | **FFNI-extraversion** | | |
|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .181 | 1.244 | .215 | .210 | 1.357 | .176 |
| **Competitive vs Cooperative** | .177 | 2.938 | .004 | .166 | 3.374 | .001 |
| **Competitive vs Ambiguous** | .050 | .628 | .531 | .059 | .760 | .448 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | .027 | -2.842 | .005 | -.344 | -3.306 | .001 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.125 | -1.021 | .309 | -.240 | -1.821 | .070 |

**Table 4c**

*Predicting the number of seasons before depletion from narcissism (antagonism and neuroticism) with a mixed model method*

| | **NARQ-rivalry** | | | **FFNI-antagonism** | | | **FFNI-neuroticism** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .280 | 1.754 | .081 | .019 | .148 | .882 | .020 | .120 | .905 |
| **Competitive vs Cooperative** | .171 | 3.610 | <.001 | .158 | 3.035 | .003 | .096 | 1.898 | .059 |
| **Competitive vs Ambiguous** | .033 | .437 | .663 | .028 | .363 | .717 | .006 | .070 | .944 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | -.454 | -3.548 | <.001 | -.321 | -2.935 | .004 | .196 | 1.755 | .081 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.291 | -2.154 | .033 | -.119 | -1.068 | .287 | -.031 | -.230 | .819 |

**Table 5**

*Correlations between the number of seasons until resource depletion and acquisitiveness and apprehensiveness (for all measures of motivation, higher numbers represent more of that motivation)*

| | **Single-item acquisitiveness** | **Single-item apprehensiveness** | **Likert-scale acquisitiveness** | **Likert-scale apprehensiveness** |
|---|---|---|---|---|
| ***r*** | -.186 | -.175 | -.186 | -.122 |
| ***p*** | .001 | .002 | .001 | .033 |

**Table 6**

*Main effect of narcissism predicting the number of fish taken in Season 1 by narcissism measure*

| | ***ß*** | ***t*** | ***df*** | ***p*** |
|---|---|---|---|---|
| **NARQ-total** | .220 | 2.233 | 293.574 | .026 |
| **FFNI-grandiose** | .210 | 2.343 | 261.773 | .020 |
| **FFNI-vulnerable** | .005 | .048 | 299.418 | .661 |
| **NARQ-admiration** | .268 | 2.719 | 285.571 | .007 |
| **FFNI-extraversion** | .116 | 1.282 | 296.451 | .201 |
| **NARQ-rivalry** | .071 | .753 | 298.463 | .452 |
| **FFNI-antagonism** | .182 | 2.087 | 270.359 | .038 |
| **FFNI-neuroticism** | -.066 | -.660 | 279.022 | .510 |

**Table 7**

*Correlations between the number of seasons until resource depletion and acquisitiveness and apprehensiveness (for all measures of motivation, higher numbers represent more of that motivation)*

| | **Single-item acquisitiveness** | **Single-item apprehensiveness** | **Likert-scale acquisitiveness** | **Likert-scale apprehensiveness** |
|---|---|---|---|---|
| ***r*** | .399 | .249 | .462 | .249 |
| ***p*** | <.001 | <.001 | <.001 | <.001 |

**Table 8a**

*Predicting total fish taken by two-dimensional model of narcissism (grandiose and vulnerable narcissism)*

| | **NARQ-total** | | | **FFNI-grandiose** | | | **FFNI-vulnerable** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .070 | .908 | .365 | .016 | .206 | .837 | .039 | .583 | .561 |
| **Competitive vs Cooperative** | .405 | 5.405 | <.001 | .404 | 5.392 | <.001 | .399 | 5.33 | <.001 |
| **Competitive vs Ambiguous** | .176 | 2.317 | .022 | .173 | 2.287 | .023 | .172 | 2.278 | .024 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | -.061 | -.998 | .319 | .002 | .035 | .972 | .065 | 1.11 | .267 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.047 | -.737 | .462 | <.000 | .001 | 1.00 | -.018 | -.320 | .749 |

**Table 8b**

*Predicting total fish taken by agentic extraversion*

| | **NARQ-admiration** | | | **FFNI-extraversion** | | |
|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .035 | .455 | .650 | .026 | .391 | .696 |
| **Competitive vs Cooperative** | .401 | 5.360 | <.001 | .402 | 5.392 | <.001 |
| **Competitive vs Ambiguous** | .176 | 2.327 | .021 | .176 | 2.337 | .021 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | -.083 | -1.325 | .187 | -.040 | -.713 | .477 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.036 | -.581 | .562 | -.037 | -.661 | .510 |

**Table 8c**

*Predicting total fish taken by narcissistic antagonism and neuroticism*

| | **NARQ-rivalry** | | | **FFNI-antagonism** | | | **FFNI-neuroticism** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .070 | .983 | .327 | .027 | .371 | .711 | .086 | 1.134 | .258 |
| **Competitive vs Cooperative** | .402 | 5.367 | <.001 | .402 | 5.33 | <.001 | .396 | 5.314 | <.001 |
| **Competitive vs Ambiguous** | .173 | 2.277 | .024 | .173 | 2.271 | .024 | .172 | 2.292 | .023 |
| **Interaction 1 (Comp vs Coop * Narcissism)** | -.006 | -.109 | .913 | .027 | .481 | .631 | <.000 | -.013 | .990 |
| **Interaction 2 (Comp vs Amb * Narcissism)** | -.031 | -.512 | .609 | .020 | .331 | .741 | -.055 | -.883 | .378 |

**Table 9**

*Correlations between the number of seasons until resource depletion and acquisitiveness and apprehensiveness (for all measures of motivation, higher numbers represent more of that motivation)*

| | **Single-item acquisitiveness** | **Single-item apprehensiveness** | **Likert-scale acquisitiveness** | **Likert-scale apprehensiveness** |
|---|---|---|---|---|
| ***r*** | -.130 | -.118 | -.127 | -.114 |
| ***p*** | .023 | .039 | .025 | .045 |

**Table 10a**

*Regression predicting acquisitiveness from the two-dimensional narcissism model (grandiose and vulnerable narcissism)*

| | **NARQ – total** | | | **FFNI-grandiose** | | | **FFNI-vulnerable** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .218 | 4.008 | <.001 | .232 | 4.277 | <.001 | .149 | 2.700 | .007 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .055 | | <.001 | .055 | | <.001 | .062 | | <.001 |
| **Interaction** | .010 | | .192 | .006 | | .368 | .014 | | .104 |

**Table 10b**

*Regression predicting acquisitiveness from agentic extraversion*

| | **NARQ – admiration** | | | **FFNI-extraversion** | | |
|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .117 | 2.094 | .037 | .119 | 2.134 | .034 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .055 | | <.001 | .054 | | <.001 |
| **Interaction** | .002 | | .709 | .001 | | .914 |

**Table 10c**

*Regression predicting acquisitiveness from antagonism and neuroticism*

| | **NARQ-rivalry** | | | **FFNI-antagonism** | | | **FFNI-neuroticism** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .234 | 4.343 | <.001 | .274 | 5.117 | <.001 | .019 | .344 | .731 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .061 | | <.001 | .061 | | <.001 | .066 | | <.001 |
| **Interaction** | .012 | | .133 | .002 | | .646 | .014 | | .104 |

**Table 11a**

*Regression predicting apprehensiveness from two-dimensional model (grandiose and vulnerable narcissism)*

| | **NARQ – total** | | | **FFNI-grandiose** | | | **FFNI-vulnerable** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .160 | 2.863 | .004 | .214 | 3.877 | <.001 | .111 | 1.960 | .051 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .033 | | .006 | .032 | | .006 | .037 | | .003 |
| **Interaction** | .003 | | .573 | .008 | | .258 | .002 | | .685 |

**Table 11b**

*Regression predicting apprehensiveness from agentic extraversion*

| | **NARQ – admiration** | | | **FFNI-extraversion** | | |
|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .176 | 3.156 | .002 | .158 | 2.819 | .005 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .030 | | .008 | .029 | | .009 |
| **Interaction** | .011 | | .172 | .009 | | .219 |

**Table 11c**

*Regression predicting apprehensiveness from narcissistic antagonism and neuroticism*

| | **NARQ-rivalry** | | | **FFNI-antagonism** | | | **FFNI-neuroticism** | | |
|---|---|---|---|---|---|---|---|---|---|
| | *ß* | *t* | *p* | *ß* | *t* | *p* | *ß* | *t* | *p* |
| **Participant narcissism** | .068 | 1.216 | .225 | .205 | 3.706 | <.001 | -.042 | -.739 | .460 |
| | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** | **$R^2$change** | | ***p*** |
| **Condition** | .036 | | .004 | .036 | | .003 | .035 | | .005 |
| **Interaction** | .011 | | .182 | .003 | | .564 | .003 | | .584 |

**Table 12**

*t statistics for the comparisons between conditions for acquisitiveness and apprehensiveness measured by the dichotomous question and sliding scale question*

| | **Acquisitiveness** | | **Apprehensiveness** | |
|---|---|---|---|---|
| | *t* | *p* | *t* | *p* |
| **Competitive - Cooperative** | 4.355 | <.001 | 3.251 | .004 |
| **Cooperative - Ambiguous** | 2.810 | .016 | 2.362 | .056 |
| **Ambiguous - Competitive** | 1.469 | .429 | .0831 | 1.00 |

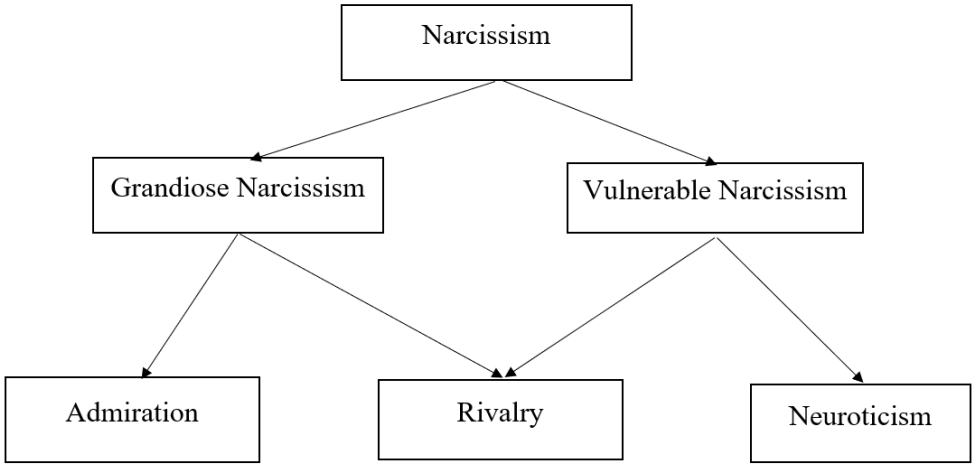
**Table 13**

*Means and standard deviations of acquisitiveness and apprehensiveness by condition*

| | Acquisitiveness (out of 1) | | Apprehensiveness (out of 100) | |
|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* |
| **Competitive** | .462 | .501 | 70.121 | 20.331 |
| **Cooperative** | .185 | .390 | 61.689 | 20.330 |
| **Ambiguous** | .367 | .485 | 67.939 | 14.808 |

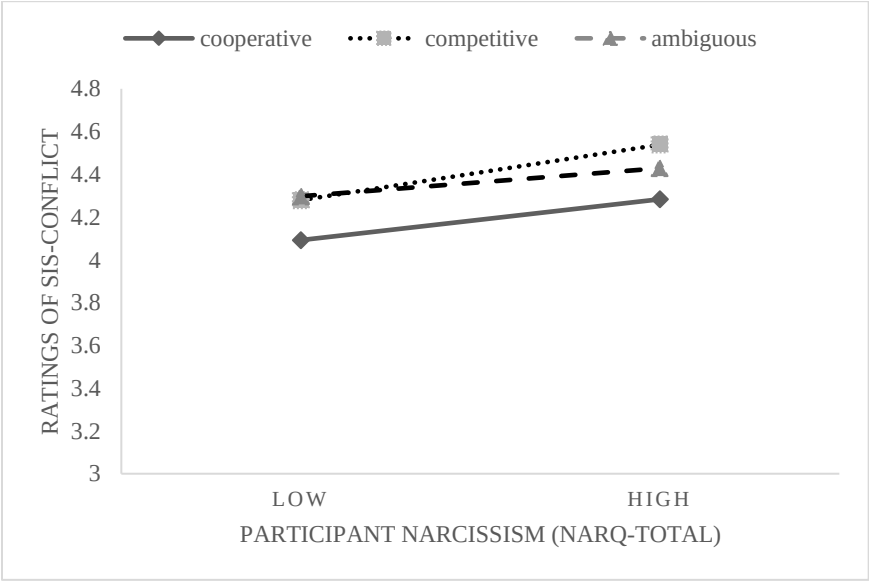
# Figures

## Figure 1



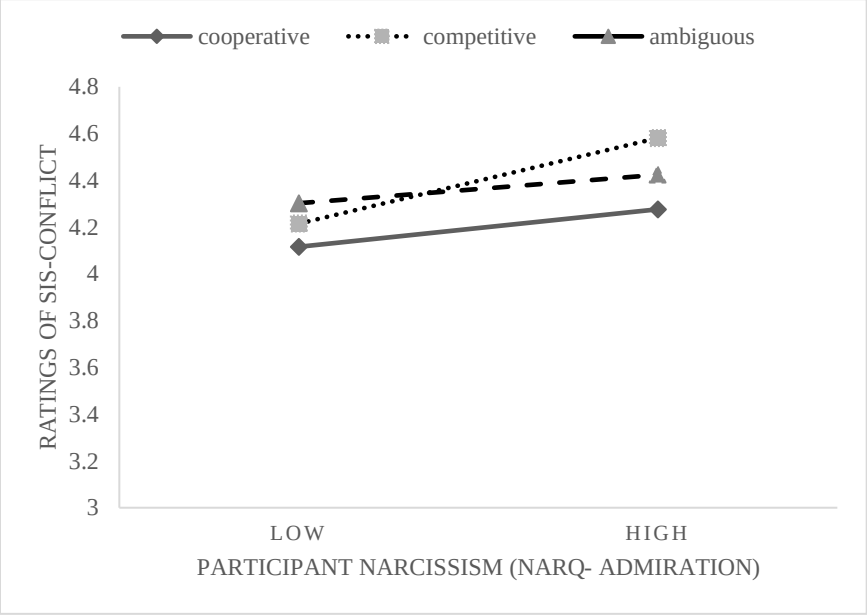

## Figure 2

*Condition (competitive, cooperative, ambiguous) and NARQ-total predicting SIS-conflict*



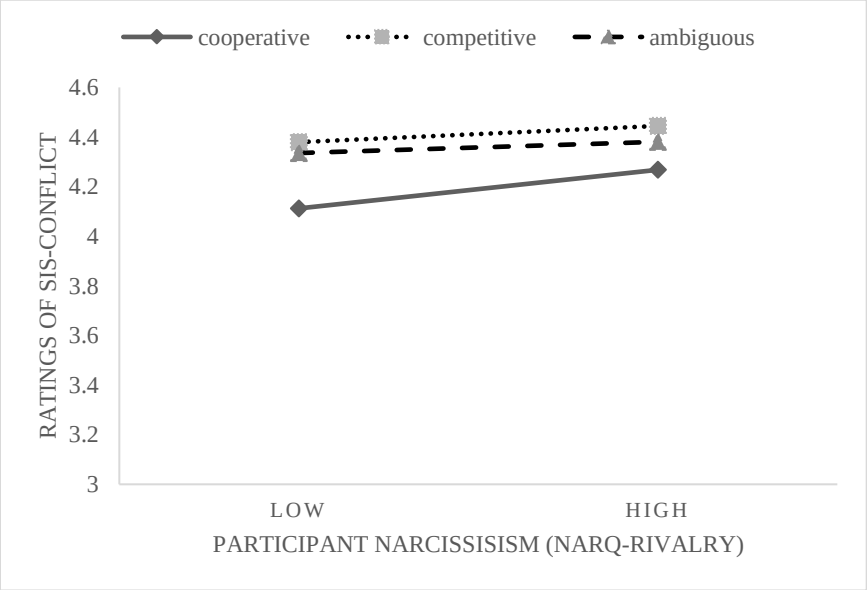
## Figure 3

*Condition (competitive, cooperative, ambiguous) and NARQ-admiration predicting SIS-conflict*

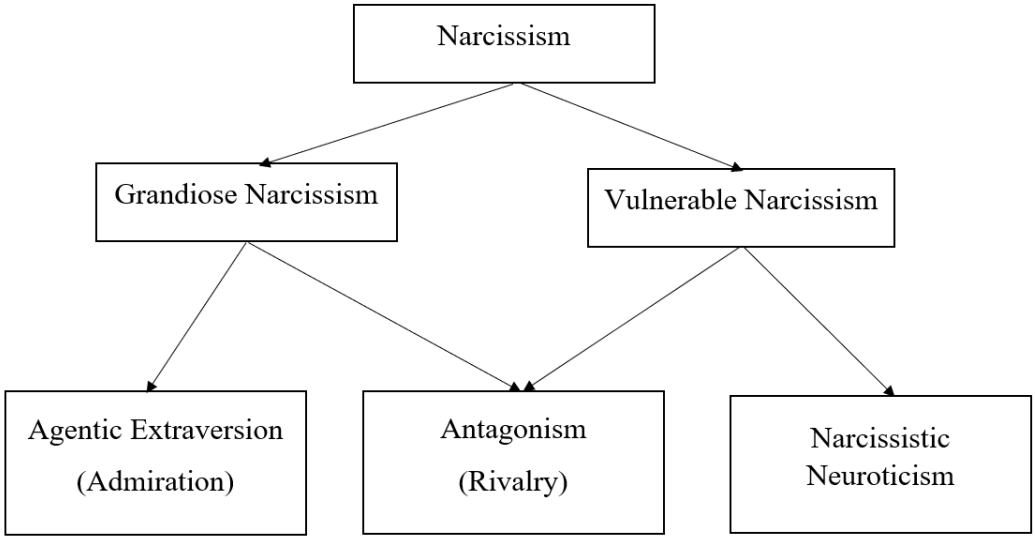



## Figure 4

*Condition (competitive, cooperative, ambiguous) and NARQ-rivalry predicting SIS-conflict*



## Figure 5




## Figure 6

*Predicting perceived conflict from NARQ-admiration and condition*

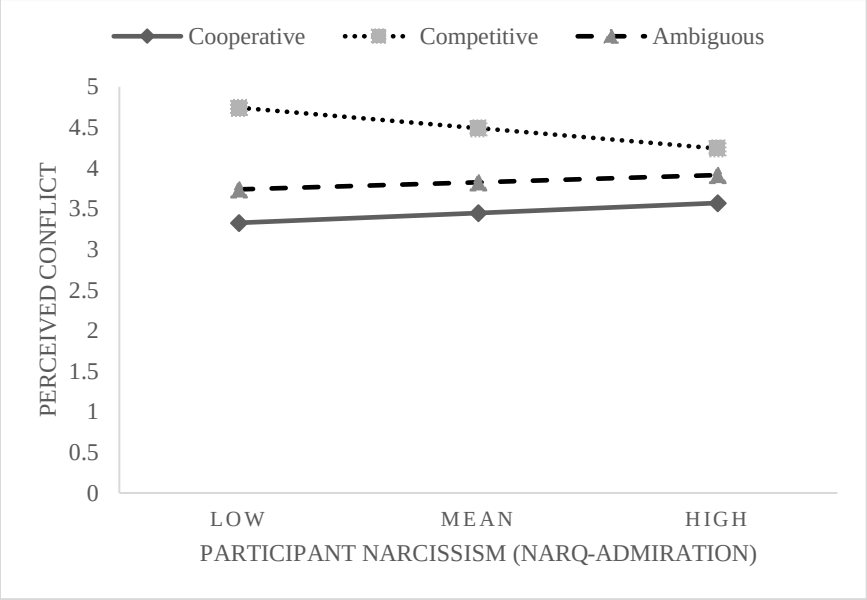


**Figure 7**

*Predicting perceived conflict from condition and FFNI-extraversion*

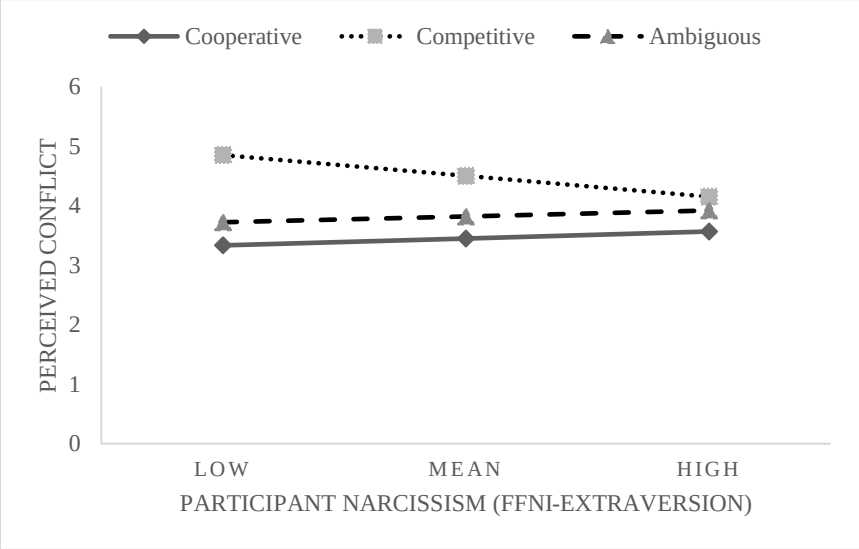



**Figure 8**

*Predicting perceived conflict from condition and FFNI-vulnerable*

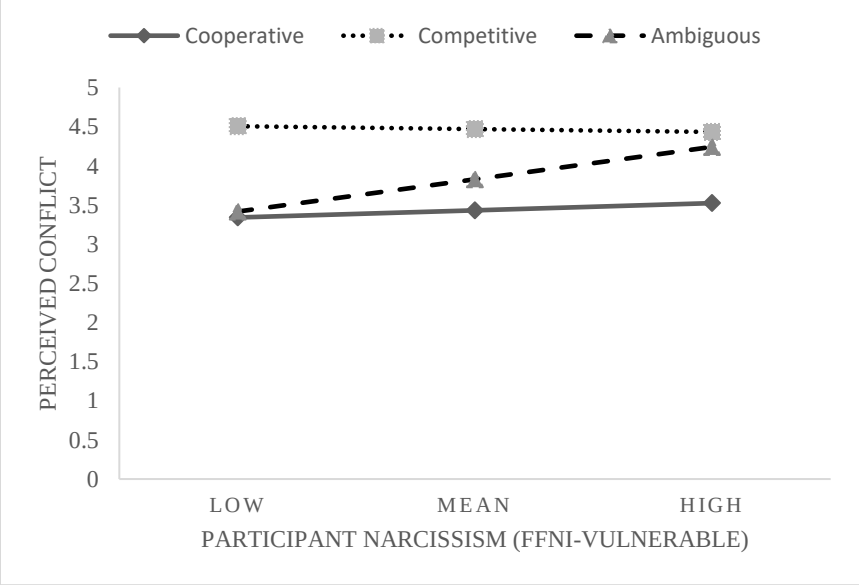


**Figure 9**

*Predicting perceived conflict from condition and FFNI-neuroticism*

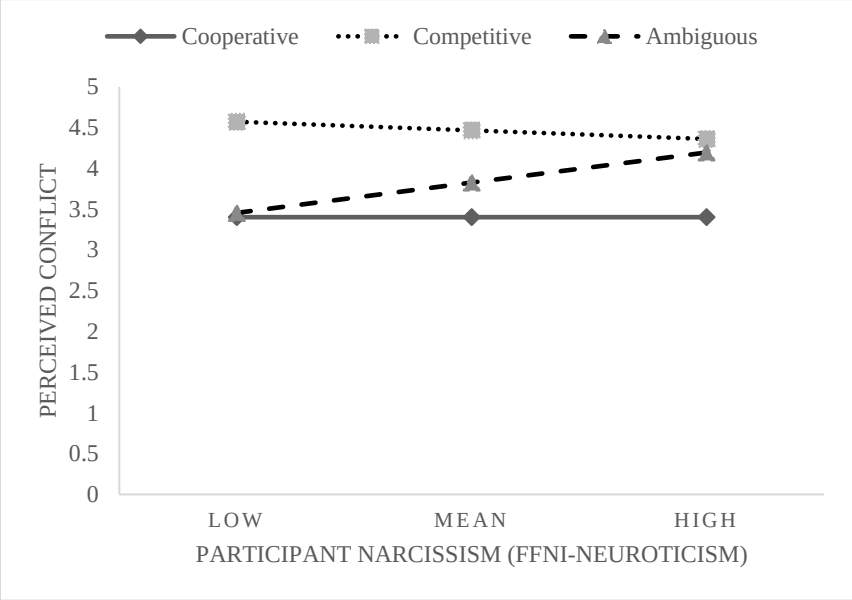



**Figure 10**

*Predicting the number of seasons until the dyad depleted resources by grandiose narcissism (NARQ-total) and condition by a linear mixed model*

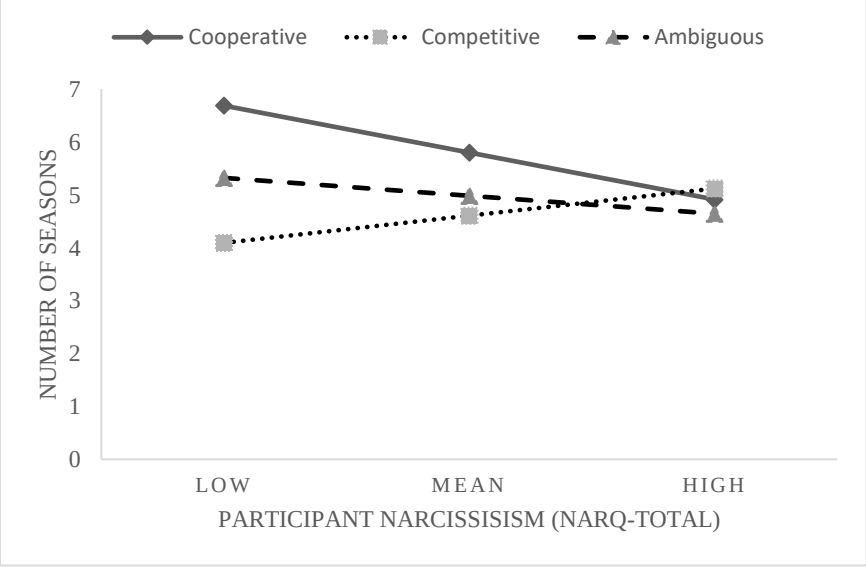


**Figure 11**

*Predicting the number of seasons until the dyad depleted resources by grandiose narcissism (FFNI-grandiose) and condition by a linear mixed model*

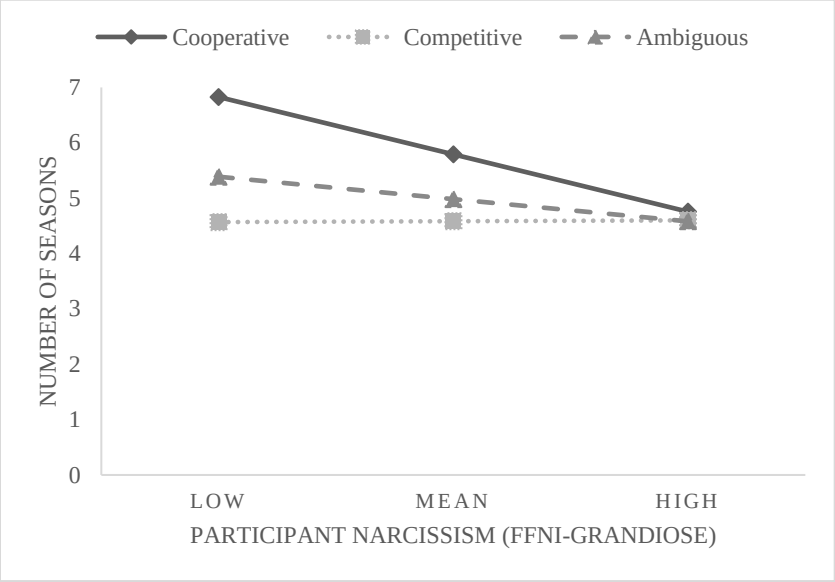



**Figure 12**

*Predicting the number of seasons until the dyad depleted resources by agentic extraversion (NARQ-admiration) and condition by a linear mixed model*

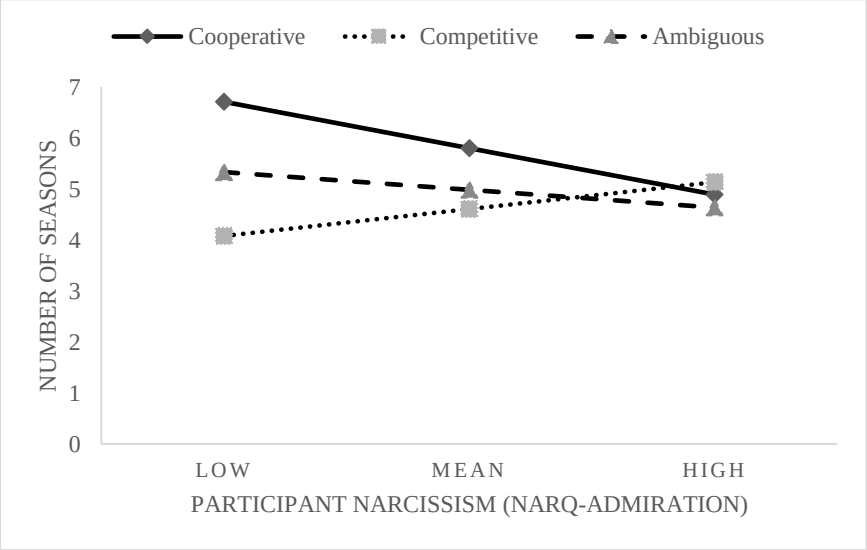



**Figure 13**

*Predicting the number of seasons until the dyad depleted resources by agentic extraversion (FFNI-extraversion) and condition by a linear mixed model*

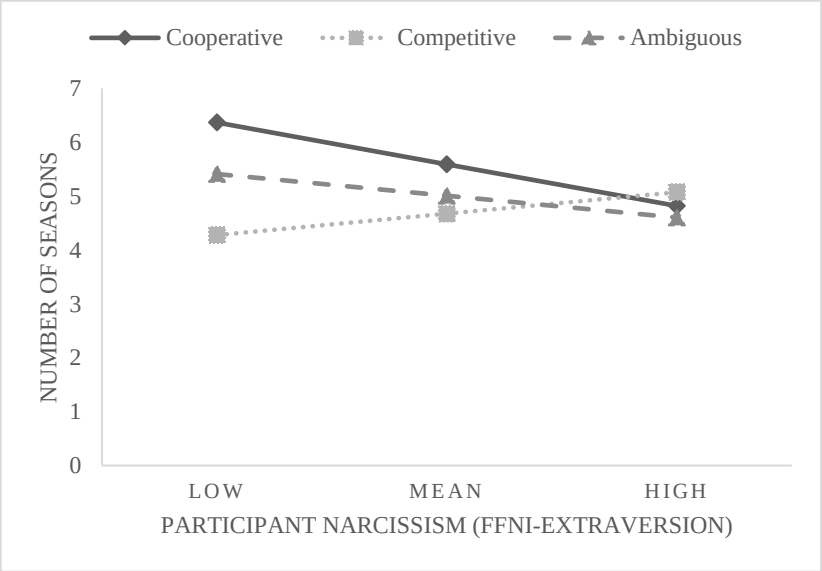



**Figure 14**

*Predicting the number of seasons until the dyad depleted resources by narcissistic antagonism (NARQ-rivalry) and condition by a linear mixed model*

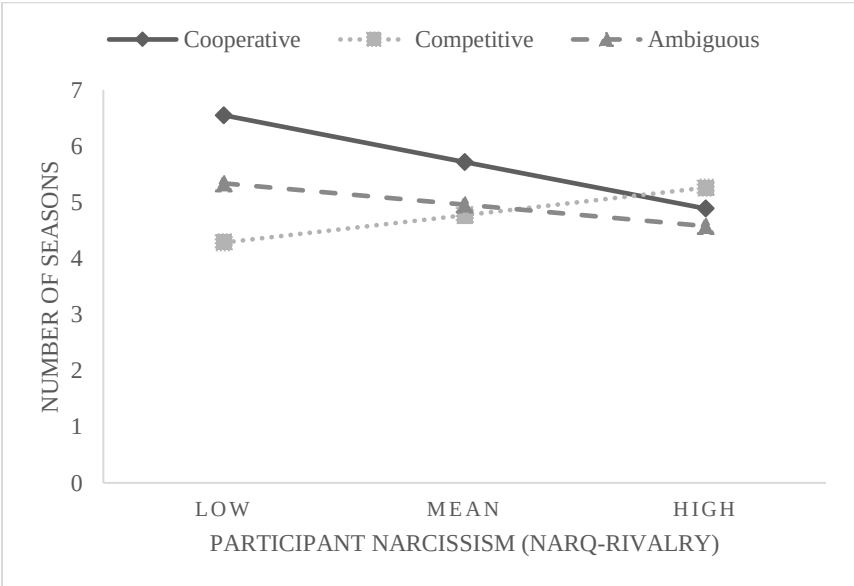



**Figure 15**

*Predicting the number of seasons until the dyad depleted resources by narcissistic antagonism (FFNI-antagonism) and condition by a linear mixed model*

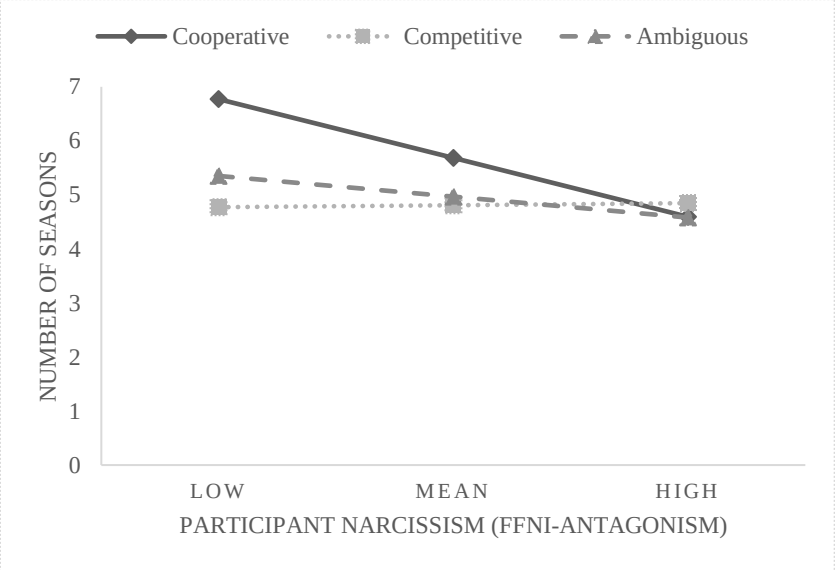



**Figure 16**

*NARQ-admiration and condition predicting number of fish taken in Season 1*

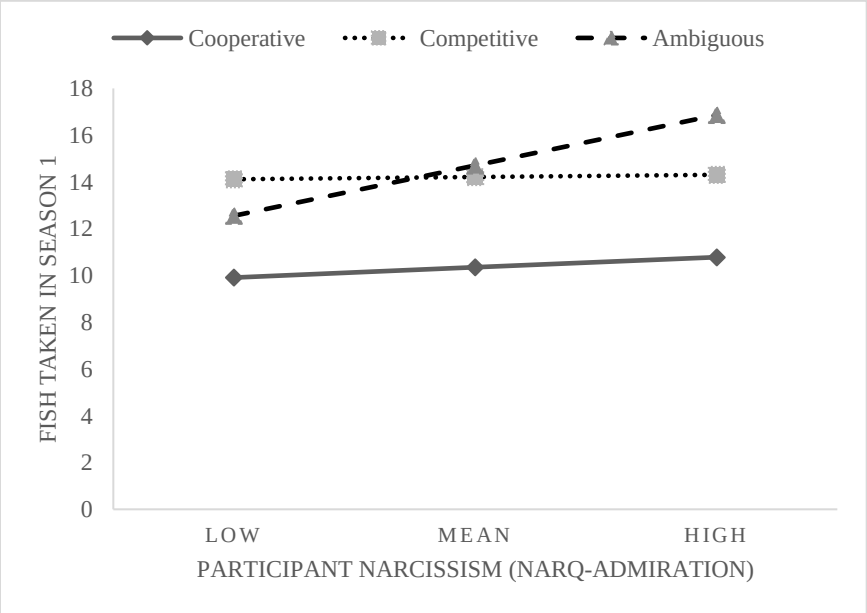



**Figure 17**

*Condition and NARQ-total predicting the total number of fish taken*

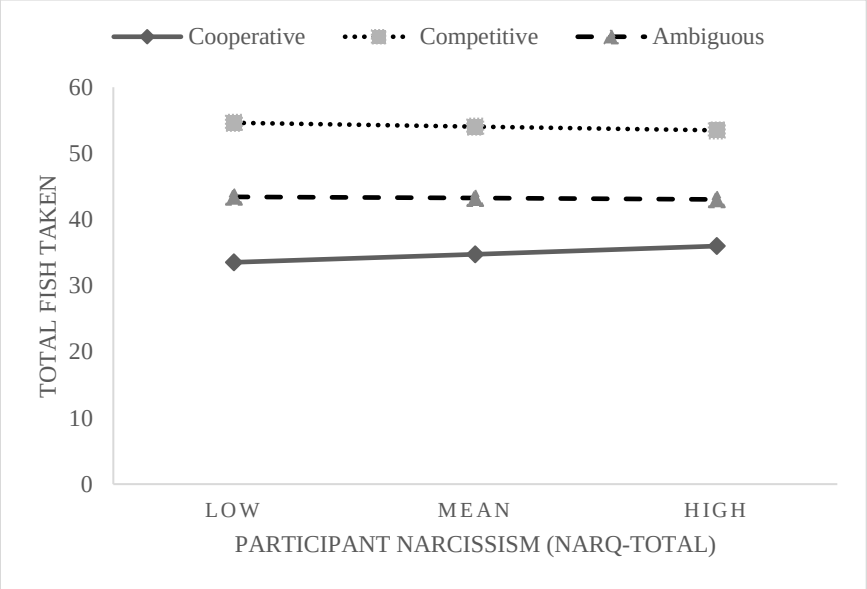



**Figure 18**

*Predicting acquisitiveness (dichotomous question) from NARQ-total and condition*

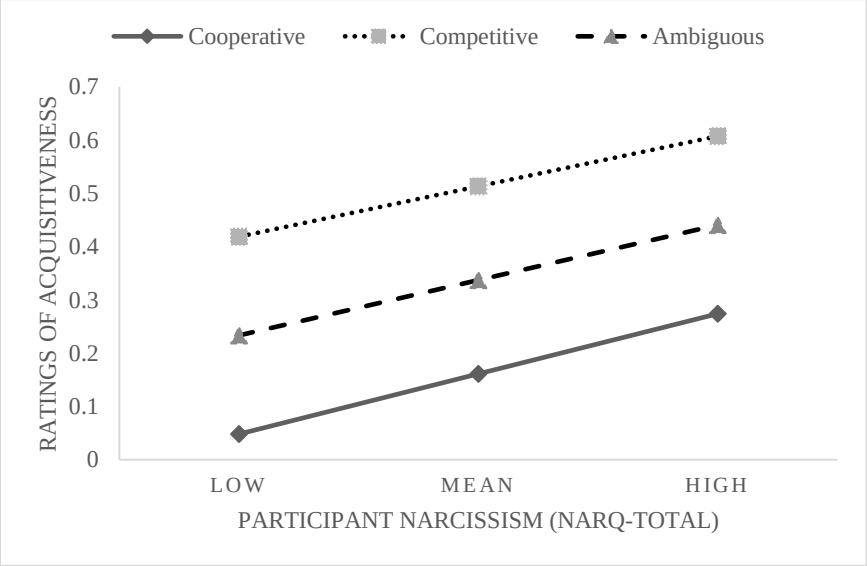


**Figure 19**

*Predicting apprehensiveness (Likert) from vulnerable narcissism (FFNI-vulnerable) and condition*

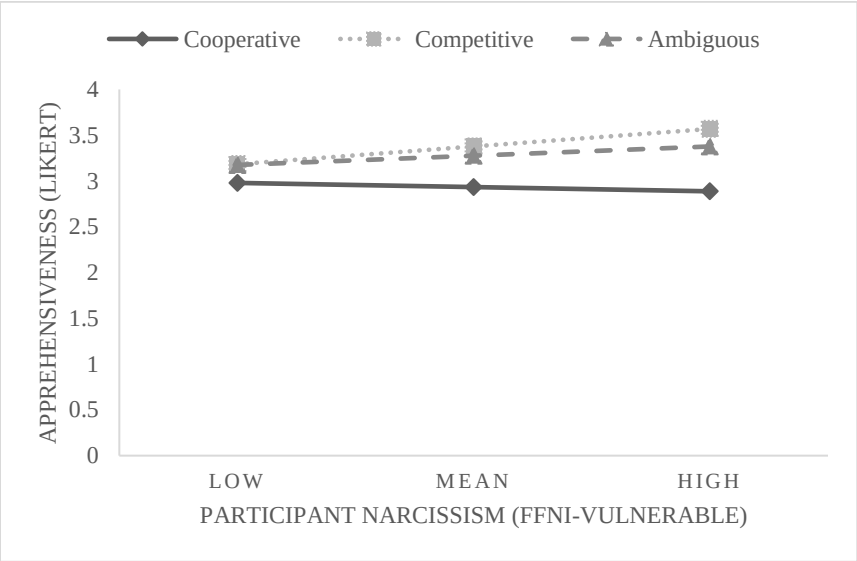
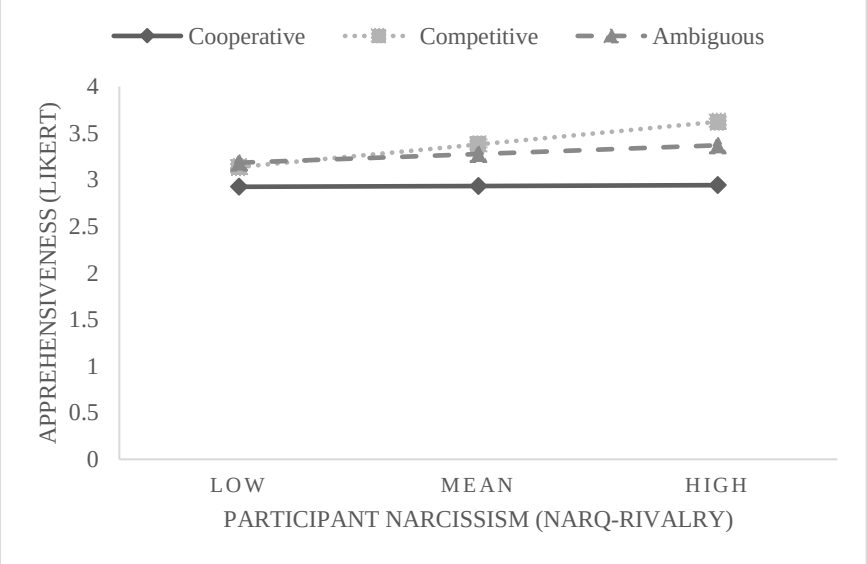



**Figure 20**

*Predicting apprehensiveness (Likert) from antagonism (NARQ-rivalry) and condition*



## Appendix A: Study 1 Wording

***Conflict Manipulation Words:***

Study, Catch, Empty, Aware, Phone, Twice, Month, Heavy, Bring, Windy

-Participants completed all ten words in a random order

***Conflict Manipulation - Word Unscrambling Game Details***

*General Instructions (seen by all participants regardless of condition).* When the game begins, you will be presented with a scrambled word. Your goal is to unscramble the word using the options provided. For the first four guesses, each option will move one letter in the word (closer or farther from the solved word). After the fourth guess, each option will either move one or two letters in the word.

There are multiple ways to unscramble every word, but some choices are better than others. You will receive points based on the quality of your choices.

*Competitive Condition Instructions (seen only by participants in condition 1.* You will be playing this game with another study participant. After you choose an option, the other participant will also choose an option. This other participant will also be assigned points based on the quality of their choices.

The person who ultimately gets to choose the solved word does not necessarily get more points than the other person. Points are assigned for each good choice.

After each word, whoever made the best choices will get to keep their points; the other will lose their points. At the end of the game, you will have a total of kept points which you can exchange for candy. 10 points = 1 piece of candy.

Please ensure you understand the instructions before pressing the next arrow.

*Cooperative Condition Instructions (seen only by participants in condition 2).* You will be playing this game with a partner. After you choose an option, your partner will also choose an option. Your partner will also be assigned points based on the quality of their choices.

The person who ultimately gets to choose the solved word does not necessarily get more points than the other person. Points are assigned for each good choice.

At the end of the game, your total point number will be a combination of your points and your partner's points (same for them). Each of you may exchange your total group score for candy. 10 points = 1 piece of candy.

Please ensure you understand the instructions before pressing the next arrow.

*Ambiguous Condition Instructions (seen only by participants in condition 3).* You will be playing this game with another study participant. After you choose an option, the other participant will also choose an option. The other participant will also be assigned points based on the quality of their choices.

The person who ultimately gets to choose the solved word does not necessarily get more points than the other person. Points are assigned for each good choice.

At the end of the game, you and your partner may exchange points for candy. 10 points = 1 piece of candy.

Please ensure you understand the instructions before pressing the next arrow.

## Appendix B: State Narcissism

In addition to being interested in how people high in trait narcissism perceive conflict, I was also interested in how the objective amount of conflict in a social situation would affect state narcissism. Although traditionally studied as a trait that remains stable over time, recent studies have found that narcissism may also fluctuate within-persons across situations. This has been called state narcissism, similar to the idea of trait versus state self-esteem, where trait self-esteem is the stable views that one holds about one's worth and state self-esteem is feelings about one's worth that can change temporarily to be more negative or more positive in situations that one finds oneself in (Anusic & Schimmack, 2016). Giacomin and Jordan (2016) found that participants reported varying levels of narcissism over a 10-day period and that the fluctuations seemed to vary meaningfully with experiences from the day. Specifically, they found that agentic experiences, such as being made a leader of a group were related to increased narcissism, whereas feeling stressed was related to decreased narcissism. These findings provide support for the idea of state narcissism because they suggest that although individuals may have a stable degree of narcissism for periods of their life (Roberts, et al., 2010), their degree of narcissism can also fluctuate within-persons on a short-term basis.

My hypothesis, tested in Study 1, is that situations with more objectively high conflict will result in increased state narcissism compared to situations with objectively less conflict, or an ambiguous level of conflict. This hypothesis builds from previous research on state narcissism, which found that agentic experiences increase state narcissism (Giacomin & Jordan, 2016). Since conflict is an aspect of interdependence that may be especially relevant to narcissism, it is important to understand if it may also influence state narcissism.

I predicted that the manipulation of conflict in Study 1 would affect state narcissism. Specifically, I predicted that those in the competitive condition, where they were informed that they will only earn points if they make better choices than the other player, will show higher scores on the post-test for narcissism compared to those in the cooperative condition. The increased post-test scores for narcissism would indicate state narcissism, as it is a measure of narcissism that has been altered by the experience of being in a high conflict game situation. Regarding the ambiguous condition, I predict that, overall, participants' state narcissism will fall between levels in the competitive and cooperative conditions. However, I also expect state narcissism in this condition will depend on participants' individual interpretation of conflict in that condition. There may be an interaction, such that state narcissism correlates more strongly with trait narcissism (and perceptions of conflict) in the ambiguous condition than in the cooperative or competitive conditions.

**Method**

See the method for Study 1. In addition, participants completed two measures of narcissism after the manipulation.

**Narcissistic Personality Inventory.** State grandiose narcissism was assessed after the manipulation using the 16-item, short version of the Narcissistic Personality Inventory (NPI-16). Each item of the NPI-16 presents pairs of statements, such as "I really like to be the centre of attention" and "It makes me uncomfortable to be the centre of attention", and participants choose the statement that is closest to describing their feelings or beliefs about themselves. The NPI-16 has good reliability and validity (Ames, et al., 2006). The NPI had an alpha of .726 in this sample.

**Single Item Narcissism Scale.** The Single Item Narcissism Scale (SINS) also measured state narcissism in this study. It is a single-item scale that asks respondents to indicate to what extent they agree with the statement "I am a narcissist", on a 7-point scale from 1 (*not at all true of me*) to 7 (*very true of me*). It is also a newer measure of narcissism but has been found to have good test-retest reliability and good convergent and predictive validity (Konrath, et al., 2014).

**Results**

To test the hypothesis that conflict would increase state narcissism, one-way ANOVAs were conducted. As expected, there was no difference in the pre-manipulation narcissism measure (trait narcissism, measured by the NARQ). Contrary to the hypothesis, there was also no difference in the post-manipulation narcissism measure (state narcissism, measured by the NPI and SINS) either, $F$ (2, 375) = .970, $p$ = .380 for the NPI and $F$ (2, 375) = .364, $p$ = .695.

Since trait narcissism and state narcissism were correlated ($r$ = .606, p <.01), this analysis was conducted again controlling for trait narcissism. There was still no significant difference in state narcissism between the three conditions, $F$ (2, 374) = .188, $p$ = .829 for NPI; $F$ (2, 374) = .001, $p$ =.999 for SINS. Mean trait and state narcissism levels are displayed in Table 14.

**Table 14**

*Mean values for participant trait* and state narcissism, and their perceptions of conflict by condition (competitive, cooperative, ambiguous)*

| **Condition** | **Trait Narcissism (NARQ-total)** | | **State Narcissism (NPI)** | | **State Narcissism (SINS)** | | **Conflict** | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| **Competitive** | 3.41 | .66 | 19.66 | 3.01 | 2.77 | 1.41 | 4.41 | .56 |
| **Cooperative** | 3.50 | .71 | 20.07 | 3.20 | 2.85 | 1.37 | 4.20 | .39 |
| **Ambiguous** | 3.40 | .54 | 19.59 | 2.57 | 2.77 | 1.33 | 4.36 | .49 |

*The measure of trait narcissism used in this table is the NARQ-total. The admiration and rivalry subscale means were different but followed the same pattern as the combined scale.

Two linear regressions were conducted to test if the interaction between condition (competitive, cooperative, ambiguous) and trait narcissism (NARQ) predicts state narcissism, either with the SINS in the first regression or the NPI in the second regression. Both regressions used effect coding. Consistent with previous findings, the NARQ significantly predicted both the SINS and the NPI. There were no significant interactions. Table 15 and Figure 21 display these results.

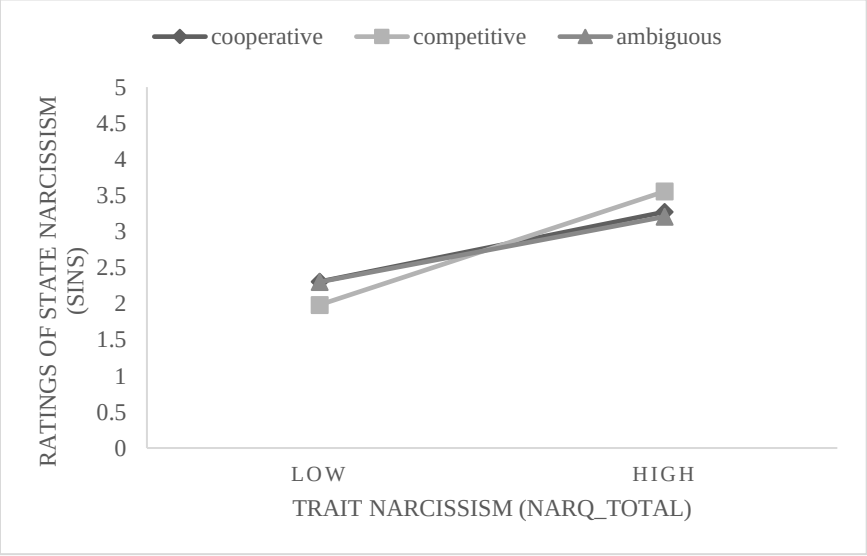
**Table 15**

*Predicting SINS and NPI from NARQ and condition*

| **DV: conflict** | **SINS** | | **NPI** | |
|---|---|---|---|---|
| | *t* | *p* | *t* | *p* |
| **Trait Narcissism (NARQ)** | 8.740 | <.001 | 14.039 | <.001 |
| | **$R^2$change** | ***p*** | **$R^2$change** | ***p*** |
| **Condition** | .000 | .999 | .001 | .829 |
| **Interaction** | .012 | .063 | .003 | .427 |

**Figure 21**

*Ratings of state narcissism, measured by the SINS, by condition and trait narcissism*



**Discussion**

The hypothesis in this portion of the study was that greater objective conflict would increase state narcissism. Using the Single-Item Narcissism Scale (SINS) we found some evidence for this. We did not find support for the hypothesis that being in the competitive condition would promote narcissism in general.

It is worth noting that future studies could improve upon our study design by using a measure specific to state narcissism to measure state narcissism. State narcissism was defined in our study by the responses to the NPI and the SINS following a conflict manipulation, however the instructions for completing these scales did not direct participants to respond according to how they feel "right now." The original, trait instructions to answer according to how they feel in general were retained. This may have affected the NPI more than the SINS, explaining why the results for the NPI and SINS differed slightly. The SINS is just one question in the present tense: "to what extent, do you agree with the statement *I am a narcissist*?" compared to the NPI which presents a series of 16 statements, some of which might cause the responder to think about the past, rather than the present (e.g., "I usually get the respect that I deserve").

## Appendix C: Measures

**Demographics Questionnaires**

How old are you (in years)? _____

What is your gender?

Male

Female

Other _____

Which of the following BEST describes your ethnic background?

Aboriginal / First Nations / Metis

White / European

Black / African / Caribbean

Southeast Asian (e.g., Chinese, Japanese, Korean, Vietnamese, Cambodian, Filipino, etc.)

Arab (Saudi Arabian, Palestinian, Iraqi, etc.)

South Asian (East Indian, Sri Lankan, etc.)

Latin American (Costa Rican, Guatemalan, Brazilian, Columbian, etc.)

West Asian (Iranian, Afghani, etc.)

Other (please specify): _____

**Rosenberg Self-Esteem Scale (RSES-10)**

Rated from 1- strongly disagree to 7- strongly agree

*Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.*

On the whole, I am satisfied with myself.

At times, I think I am no good at all. (R)

I feel that I have a number of good qualities.

I am able to do things as well as most other people.

I feel I do not have much to be proud of. (R)

I certainly feel useless at times. (R)

I feel that I am a person of worth, at least on an equal plane with others.

I wish I could have more respect for myself. (R)

All in all, I am inclined to feel that I am a failure. (R)

I take a positive attitude towards myself.

**Narcissistic Admiration and Rivalry Questionnaire (NARQ-18)**

*Please indicate how much the following statements apply to you using a response format ranging from "1 = completely disagree" to "6 = agree completely".*

I am great. (Ad)

I will someday be famous. (Ad)

I will show others how special I am. (Ad)

I react annoyed if another person steals the show from me. (Riv)

I enjoy my successes very much. (Ad)

I secretly take pleasure in the failures of my rivals. (Riv)

Most of the time, I am able to draw people's attention to myself in conversations. (Ad)

I deserve to be seen as a great personality. (Ad)

I want my rivals to fail. (Riv)

I enjoy it when another person is inferior to me. (Riv)

I often get annoyed when I am criticized. (Riv)

I can barely stand it if another person is at the centre of events. (Riv)

Most people won't achieve anything. (Riv)

Other people are worth nothing. (Riv)

Being a very special person gives me a lot of strength. (Ad)

I manage to be the centre of attention with my outstanding contributions. (Ad)

Most people are somehow losers. (Riv)

Mostly, I am very adept at dealing with other people. (Ad)

**Ten-Item Personality Inventory (TIPI) / Big Five**

Rated from 1 – strongly disagree to 7 – strongly agree

*Here are a number of personality traits that may or may not apply to you. Please indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.*

*I see myself as…*

Extraverted, enthusiastic

Critical, quarrelsome (R)

Dependable, self-disciplined

Anxious, easily upset

Open to new experiences, complex

Reserved, quiet (R)

Sympathetic, warm

Disorganized, careless (R)

Calm, emotionally stable (R)

Conventional, uncreative (R)

**Preference for Consistency (PFC-18)**

Rated from 1- strongly agree to 7- strongly disagree

*Please indicate how much you agree with the following statements.*

I prefer to be around people whose reactions I can anticipate.

It is important to me that my actions are consistent with my beliefs.

Even if my attitudes and actions seemed consistent with one another to me, it would bother me if they did not seem consistent in the eyes of others.

It is important to me that those who know me can predict what I will do.

I want to be described by others as a stable, predictable person.

Admirable people are consistent and predictable.

The appearance of consistency is an important part of the image I present to the world.

It bothers me when someone I depend upon is unpredictable.

I don't like to appear as if I am inconsistent.

I get uncomfortable when I find my behaviour contradicts my beliefs.

An important requirement for any friend of mine is personal consistency.

I typically prefer to do things the same way.

I dislike people who are constantly changing their opinions.

I want my close friends to be predictable.

It is important to me that others view me as a stable person.

I make an effort to appear consistent to others.

I'm uncomfortable holding two beliefs that are inconsistent.

It doesn't bother me much if my actions are inconsistent. (R)

**Narcissistic Personality Inventory**

*Read each pair of statements below and choose the one that comes closest to describing your feelings and beliefs about yourself. You may feel that neither statement describes you well, but pick the one that comes closest. Please complete all pairs.*

I really like to be the centre of attention; It makes me uncomfortable to be the centre of attention.

I am no better or no worse than other people; I think I am a special person.

Everybody likes to hear my stories; Sometimes I tell good stories.

I usually get the respect I deserve; I insist upon getting the respect that is due to me.

I don't mind following orders; I like having authority over people.

I am going to be a great person; I hope I am going to be successful.

People sometimes believe what I tell them; I can make anybody believe anything I want them to.

I expect a great deal from other people; I like to do things for other people.

I like to be the centre of attention; I prefer to blend in with the crowd.

I am much like everybody else; I am an extraordinary person.

I always know what I am doing; Sometimes I am not sure what I am doing.

I don't like it when I find myself manipulating people; I find it easy to manipulate people.

Being an authority doesn't mean that much to me; People always seem to recognize my authority.

I know that I am good because everyone keeps telling me so; When people compliment me, I sometimes get embarrassed.

I try not to show off; I am apt to show off if I get the chance.

I am more capable than other people; There is a lot that I can learn from other people.

**Situational Interdependence Scale**

Rated from 1- completely disagree to 7- completely agree

*For each item, please think of the game you just played and indicate how strongly you agree or disagree with how the statement describes that situation. In each item "the other" refers to the person you played [against / with].*

***Mutual Dependence***

Each person's actions only affect their own outcomes, and not the other's outcomes.

What each of us does in this situation affects the other.

Whatever each of us does in this situation, our actions will not affect the other's outcomes.

We need each other to get out best outcome in this situation.

Each person's outcomes are not influenced by what the other does.

Each person's outcomes depend on the behaviour of the other.

***Conflict***

The other prefers different outcomes than I do in this situation.

We can both obtain our preferred outcomes.

It is difficult to make us both happy with the outcomes of this situation.

Both of us can achieve our most desired outcomes in this situation.

Our preferred outcomes in this situation are conflicting.

What satisfies me also satisfies the other.

***Power***

Rated from 1 (definitely the other) to 5 (definitely myself)

Who do you feel was the most in control of what happens in this situation?

Who has the least control to determine their own outcomes in this situation?

Who do you feel had more power to determine their own outcome in this situation?

Who do you feel had the weakest influence on the outcomes of this situation?

Who has the most impact on what happens in this situation?

Who has the least amount of influence on the outcomes of this situation?

**Single Item Narcissism Scale**

Rated from 1 (not very true to me) to 7 (very true of me)

To what extent do you agree with this statement: "I am a narcissist." (Note: The word "narcissist" means egotistical, self-focused, and vain.)

**Five Factor Narcissism Inventory**

Rated from 1 (strongly disagree) to 5 (strongly agree)

*Please read each item carefully and provide your answer that best corresponds to your agreement or disagreement. There are no right or wrong answers. Describe yourself honestly and state your opinions as accurately as possible.*

I am extremely ambitious.

Others say I brag too much, but everything I say is true.

Leadership comes easy for me.

When someone does something nice for me, I wonder what they want from me.

I deserve to receive special treatment.

I get lots of enjoyment from entertaining others.

It's fine to take advantage of persons to get ahead.

I often fantasize about someday being famous.

When people judge me, I just don't care.

I don't worry about others' needs.

I'm pretty good at manipulating people.

I often feel as if I need compliments from others in order to be sure of myself.

I hate being criticized so much that I can't control my temper when it happens.

When I realize I have failed at something, I feel humiliated.

I will try almost anything to get my "thrills".

I have a tremendous drive to succeed.

I only associate with people of my caliber.

I am comfortable taking on positions of authority.

I trust that other people will be honest with me.

I don't think the rules apply to me as much as they apply to others.

I like being noticed by others.

I will use persons as tools to advance myself.

I often fantasize about having lots of success and power.

I don't really care what others think of me.

I don't generally pay much attention to the woes of others.

I can maneuver people into doing things.

I am stable in my sense of self.

I have at times gone into a rage when not treated rightly.

I feel awful when I get put down in front of others.

I am a bit of a daredevil.

I aspire for greatness.

I do not waste my time hanging out with people who are beneath me.

Persons generally follow my lead and authority.

I'm slow to trust people.

It may seem unfair, but I deserve extra (i.e., attention, privileges, rewards).

I like being the most popular person at a party.

Sometimes to succeed you need to use other people.

I rarely fantasize about becoming famously successful.

I'm pretty indifferent to the criticism of others.

I'm not big on feelings of sympathy.

I can talk my way into and out of anything.

I feel very insecure about whether I will achieve much in life.

It really makes me angry when I don't get what I deserve.

I feel ashamed when people judge me.

I would risk injury to do something exciting.

I am driven to succeed.

I am a superior person.

I tend to take charge of most situations.

I often think that others aren't telling me the whole truth.

I believe I am entitled to special accommodations.

I love to entertain people.

I'm willing to exploit others to further my own goals.

Someday I believe that most people will know my name.

Others' opinions of me are of little concern to me.

I don't get upset by the suffering of others.

It is easy to get people to do what I want.

I wish I didn't care so much about what others think of me.

I feel enraged when people disrespect me.

I feel foolish when I make a mistake in front of others.

I like doing things that are risky or dangerous.

**Strategy Questionnaire**

Once the fishing simulation begins, which strategy, in general, do you intend to adopt? (check one):

-Maximize your own earnings

-Ensure the stock of fish is not reduced to 0.

If all students on campus participated in this study and were asked the question above, what percentage to you think would choose to maximize their own earnings?

0-100% sliding scale

To what extent do you plan to adopt a strategy of maximizing your own earnings?

1 (Not at all) to 3 (Some of the time) to 5 (All the time)

To what extent do you plan to adopt a strategy to ensure the stock of fish is not reduced to 0?

1 (Not at all) to 3 (Some of the time) to 5 (All the time)

To what extent do you think your partner will adopt a strategy of maximizing their own earnings?

1 (Not at all) to 3 (Some of the time) to 5 (All the time)

To what extent do you think your partner will adopt a strategy to ensure the stock of fish is not reduced to 0?

1 (Not at all) to 3 (Some of the time) to 5 (All the time)

**Suspicion Probe**

At any point during the study, did you have questions that were not answered at the start of the

study? If so, what were those questions and when did they occur to you?

Yes (blank to elaborate) or no

Did anything seem inconsistent with how the study was described to you at the start?

Yes (blank to elaborate) or no

What do you think this study is about?

Blank to answer.

**Attention Check**

Your answer to this question will not affect your study compensation (if you answer 'no', you will still get full compensation). When conducting research, we rely on participants' paying attention, and being as honest and accurate as possible when answering questions. However, we recognize there are many reasons participants may be unable or unwilling to pay attention or give completely honest and accurate responses. It is truly helpful for us to be able to identify responses that may not be valid so we can take this into account.

Keeping this in mind, should we use the data from your survey?

(Please note your answer is confidential and you will be compensated whichever answer you choose).

Yes or no

## Appendix D: Study 2 Wording

***Commons Dilemma Game Play Instructions***

- https://www.youtube.com/watch?v=9PGam-zTKcY

***Comprehension Questions Taken from the Video***

In the first season, if your group catch a total of 60 fish, how many fish will be available for the next season? (Multiple choice options: 5, 40, 138)

If, by the end of the first season, you and others catch a total of 20 fish, how many fish will be available for the second season? (Options: 0, 25, 80)

When will fishing end? (Options: When all fish are caught, When the seasons end, Both A & B)

***Commons Dilemma Condition-Specific Instructions***

*General Instructions (seen by all participants regardless of condition).* We are now going to move onto the fishing game. It is important that you understand the rules for the game.

On the next screen you will see a video showing how to fish. This video is a general description of how to play the game, but for our study, there are other specific things to know.

1. There will be 7 seasons of fishing in this game.

*Competitive Instructions (seen by participants in condition 1 only).*

2. During the game, you will earn "money" for the fish you catch. This money will be exchanged for real tickets to win a $50 Chapters or Starbucks giftcard.

3. You will be granted tickets only if you earn MORE money than the other player.

Less than the other player = 0 tickets

The same as but less than 2x more = 1 ticket

2x more = 2 tickets

3x more = 3 tickets

Etc.

*Cooperative Instructions (seen by participants in condition 2 only).*

2. During the game, you will earn "money" for the fish you catch. This money will be exchanged for real tickets to win a $50 Chapters or Starbucks giftcard.

3. You will be granted tickets based on the COMBINATION of your money and the other player's money. E.g. if you earn 50 cents and the other earns 35 cents, you both earn a total of 85 cents.

$0.00 to $0.50 = 0 tickets for both of you

$0.51 to $1.50 = 1 ticket for both of you

$1.51 to $2.50 = 2 tickets for both of you

Etc.

*Ambiguous Instructions (seen by participants in condition 3 only).*

2. During the game, you will earn "money" for the fish you catch. This money will be exchanged for real tickets to win a $50 Chapters or Starbucks giftcard.

3. You will be granted tickets calculated based how much money you and the other player both earn.

## Appendix E: Restrain and Efficiency

### Fishing Behaviour: Average Individual Restraint

Restraint was calculated by the fishing program for each season as a function of how many fish a player takes, how many fish are remaining, and how many players are in the game (in this study, this was always two), where a higher number indicates greater restraint than a lower number. The restraint scale goes from 1 to -1, such that if a player takes no fish in a season, their restraint is recorded as 1, if they take half the fish in a season, their restraint is recorded as 0, and if they take all the fish, their restraint would be recorded as -1. I calculated an average restraint for each participant across the number of seasons that they completed.

Then the same mixed model procedure was used from above to test if individual restraint was predicted by narcissism or perceived conflict, acknowledging the possibility that an individual's restraint was affected by the other person in the game.

There was no significant effect of narcissism (using any measure) on average individual restraint, however condition did significantly predict it. The differences were between the competitive and cooperative condition ($t$ (160.220) = 4.750, $p$ <.001), and between the ambiguous and cooperative condition ($t$ (157.622) = 3.881, $p$ <.001).

### Fishing Behaviour: Average Individual Efficiency

Efficiency was also calculated by the fishing program for each season as a function of the original number of fish, the number of fish at the start of the season, and the regeneration rate (in this study, always double). The perfectly efficient fisher takes the maximum number of fish that they can while still allowing the stock to completely replenish to the original number of fish, and this is recorded as "1" by the program for efficiency. Like restraint, I calculated an average individual efficiency per the number of seasons completed for each participant.

Once again, the same mixed model procedure was used to test if average individual efficiency was predicted by participant narcissism or perceived conflict. Again, no measure of narcissism significantly predicted individual efficiency. There were no significant interactions. Condition did predict it; specifically, individual efficiency was higher for the cooperative condition than the ambiguous condition, $t$ (153.883) = 4.352, $p$ <.001, and it was also higher for the cooperative condition than the competitive condition, $t$ (155.263) = 5.208, $p$ <.001.